KOBE ECONOMIC & BUSINESS REVIEW

22nd ANNUAL REPORT

THE RESEARCH INSTITUTE FOR
ECONOMICS AND BUSINESS ADMINISTRATION
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CONTENTS

PIONEERING IN AUSTRALIAN DIRECT TRADE: THE LIFE OF FUSAJIRO KANEMATSU, 1845-1913

Tadakatsu INOUE

Foreign trade in Kobe, begun with the opening of the port in the Hyogo district in 1867, took for rather long period of time the form of the so called "settlement trade" or "foreign firms trade." That is, those engaged in foreign trade were the foreign trading houses situated in the settlements established in 1868, and the Japanese merchants participated in foreign trade only as "selling merchants" selling export goods to these foreign merchants or as a "buying merchants" purchasing import goods from them. Therefore, from the point of view of the Japanese merchants, except that foreign merchants were added to their business, there was not much difference from their traditional domestic trade. This situation existed not only in Kobe but also in other open ports including Yokohama. According to *Nihon Boeki Shi* (History of Trade in Japan) (1948) by Eitaro Tokumasu, the ratio handled by foreign merchants in the total amount of export and import was 99.6 per cent in 1874, 97.4 per cent in 1877, 92.2 per cent in 1882, 87.6 per cent in 1887 and 80.4 per cent in 1892. Although the figures show a decreasing trend, even in the 1890's more than 80 per cent of the trade was done by foreigners.

It can not be denied that this settlement trade brought benefits to the Japanese people at a time, especially, when they were unfamiliar with foreign affairs as well as lacking in the ability of foreign business practices. Nevertheless, under such a trade system, the profit monopolization by foreigners was unavoidable. Although the above cited *History of Trade* and *Kindai Nihon Boeki Shi* (History of Trade in Modern Japan) (1959–61) by Kiyoshi Matsui threw light on the disadvantages of the Yokohama merchants, the earlier history of Kobe was also full of grievances as for the Japanese merchants engaged in foreign trade. For example, describing the indiscretion of tea manufacturers and the shrewdness of foreign merchants, *Kobe Kaiko Sanjunen Shi* (Thirty Years Progress of Kobe Port) (1898) points out the abuse of the *peke* (rejection) right by foreigners in the settlements in the following terms:

"Not only in tea trade but also in all trade of export goods through the foreign firms in the settlements, the customary evil exists in the fact that, after the inspection of samples, they contract with us as to the volume, the date of delivery and their price, but when the goods are delivered, they check them thoroughly and once they dislike them without any definite reason, they devise pretences for cancellation, or

demanding price reductions. Under such circumstances, if the goods are sold at their reduced price, a loss for our domestic merchants is inevitable. However, to our regret, the goods are already in their warehouses, and if we refuse to comply with their demands and take a long time for negotiations, even the storage charges are imposed on us. Especially in the case of ordered goods, returned with the claim of not coming up the quality of the samples, our merchants are forced to dispose of these goods at discounted prices for prompt transaction, because it is very difficult to dispose of such kinds of goods. Thus the foreign merchants knowing the circumstances of our domestic merchants, abuse of the *peke* right which they think the best way to distress the Japanese merchants."

Although the beginning of trade in Kobe was such a humiliating one, gradually there appeared merchants in the region who came to attempt to break the bonds with these foreign trading houses and to trade directly with merchants overseas. In *Kobe Boeki Kyokai Shi* (History of the Kobe Trade Association) (1968) several men are listed of this type of merchants.

Kanbei Ikeda was a merchant who pioneered in the trade with Korea. At first Ikeda was hired by a foreign firm in Yokohama, then as the company opened a branch office in Kobe, he came down here as an office staff. Soon he resigned from the company to become an independent tea dealer and in 1882 opened a shop for tea trade, establishing in the same year a branch office in Pusan, then proceeded to Wonsan. His business activity was apparently trade in tea, though no precise records are avairable. In an attempt to explore the trade with Australia, Seiuemon Ikeda, Tokusaburo Hamada, Shin Horiuchi and some other merchants established in 1883 a company named Makoto Shokai. This company is said to have sent men to Australia for the inspection and in fact, scarce as they are, there are some evidences to show that the company exported goods. A tea merchant named Sadakichi Takeda is said to have inspected the American market in 1885 and visited in 1890 Vladivostok with a business purpose related to the tea trade with a firm to which he had been sending samples. In addition to these merchants, we can mention Taizo Takasu who made a plan to export leather made in the Himeji district. However, most of the efforts by these forerunners to explore foreign markets by themselves seem to have aborted. As the *History of the Kobe Trade Association* points out, the fact that "not only did they lack in the knowledge on trading and establishing connections with foreign firms, but also their financial resources were insufficient" would explain the reasons why their ventures had failed.

Among these general trends, however, there were some successful merchants who were able to become independent traders and eventually lay a cornerstone in the foundation of the development of trade in Japan as well as in Kobe. Both Shinkichi Tamura, founder of the present Tamura Trading Company and explorer of

the trade with Canada, and Fusajiro Kanematsu, the pioneer in the direct trade with Australia and founder of the present Kanematsu-Gosho Trading Company are typical examples of such merchants.

This paper attempts to throw some light on the latter merchant. Fortunately, concerning the life of Kanematsu, useful documents are available, which include Buntaro Nishikawa's *Kanematsu Goshuo* (Old Mr. Kanematsu) (1914), Kanematsu Co.'s *Kanematsu Kaiko Rokujunen* (Sixty Years Retrospect of Kanematsu) (1950) and *Kanematsu no Kao* (Profile of Kanematsu, 75 Years Young) (1965), and Kurando Koga's essays on Fusajiro Kanematsu contributed to *K G Mansuri* (K G Monthly), Nos. 288, 302, and 314. Using these documents, we will make clear what kind of person was he who went over to Australia as early as 1887 to open direct wool trade? What experiences had he in his childhood? What situations and motives brought him to such a venturous business at the time? How did he challenge and overcome the difficulties he faced?

I. Childhood of Kanematsu

Fusajiro Kanematsu was born on May 21 in 1845 in Osaka. His father, Yahei Hiroma, had come from a small villege in Owari (Aichi Prefecture), working as a live-out clerk of a tatami-matting trader in Osaka when he was born. However, in less than three months after his birth, his father went away without saying good-bye to the family. When he was about four years old, his mother, Yae, married a fish-monger named Kitamura of Kyoto, but again, his second father died when he was thirteen years old—adverse circumstances indeed.

When he was eleven years old, he was an apprentice of a soybean products dealer named Yoshiya in Kyoto, and this was the beginning of hard apprenticeship for him. However, when we look at his boyhood career, we soon find that he changed jobs very often. In less than two years, he quit his first job in Kyoto and became an apprentice of Tanbaya Manzo in Osaka, but he could not stay there long and soon came back to Kyoto, finding a job at a drygoods dealer named Funasho. There he was treated so cruelly that he was said to have attempted one day to commit suiside. After one and a half years, he left this job again to find another one at a candle dealer of the same city, followed by the apprenticeship at a rice dealer of Osaka.

As to the reason why Fusajiro changed his jobs so frequently, the above mentioned *Old Mr. Kanematsu* and *Sixty Years Retrospect* say that it should not necessarily be attributed to his lack of perseverance but to his having been out of a proper place. Nevertheless, it was socially sanctioned virtue at the time for every apprentice to devote himself to his master no matter how hard his task might be. It is no doubt

that Fusajiro knew that he should have behaved just like expected, but at the same time, it is probable that he was not a man who could easily adjust himself to the society with fixed social standings under the feudal regime. In his body, blood to look for something else had always been streaming, boiled up by adverse circumstances and eventually made him feel unsatisfied with the existing state of affairs and thus changed his place of work as a migratory bird.

In 1862, when he was seventeen years old, looking to his temporary acquaintance, Fusajiro went up to Edo (Tokyo) and got a job as a helper of a gatekeeper in the house of a certain Ohno who was then a steward of a "Hatamoto" (top ranking samurai of the Tokugawa Shogunate) named Okabe Suruganokami. Later he worked for Okabe and before long he bought a "kabu" (title) to become a lower ranking samurai. Presumably, his desire for self-expression explains such a behavior, that is, he thought it must be the best way to join the samurai class in order to achieve glorious fame in the feudal society even if it were on the way to disintegration. Although the reason is not clear, after about this event, he took the family name of one of his relatives and came to call himself Fusajiro Kanematsu.

As a samurai, Fusajiro practiced gunnery, and in the war of Tsukuba he was in the field as a platoon commander of the Shogunate forces, fighting for ten months. This military life was, however, far from satisfying Fusajiro's ambitions. Consequently, he decided to quit samurai life and to engage again in business. The above cited *Old Mr. Kanematsu* tells his state of mind at the time as follows.

"Once I had the aspiration to be samurai. But after observing the reality of samurai life, I became aware of my misjudgement and felt that if I strived for the military arts, I might be promoted to such a high rank as a battalion commander or a regimental commander, but after all it would be nothing very great."

In 1865, Fusajiro Kanematsu resigned as a samurai for reasons of health and went to the newly opened Yokohama port, spending some time there inspecting the state of business, then went back to his home town, Osaka. Soon the war between the Tokugawa and the Choshu-clan broke out, and taking advantage of this occasion, the ex-samurai Fusajiro purchased sake (rice wine) casks to sell them to the forces of the Choshu-clan and earned some money. Since then, however, while teaching the village children writing and reading at his relative's home, he spent his days waiting for his chance. In due course of time, the Meiji Restoration was accomplished, at that time Fusajiro was twenty-three years old.

II. Kanematsu in the Early Part of the Meiji Period

What Kanematsu attempted at first in the Meiji era was to engage in business in the open port city. The main open port at the time was Yokohama accounting

for 70 per cent of the foreign trade of Japan, so it was quite natural for him to turn his eyes to this port. In transactions of cotton cloth, cotton yarn and groceries, he made a considerable amount of profit, though it was said that he was "obliged to go back to Osaka" before long. Then he went to Kobe and became an agent in the coal business. After one year of profitable business, his agency went bankrupt, and he went to Niigata to attempt to trade with foreigners as well as domestic merchants, which, within one and a half years, brought him a rather large fortune. Then, with a heavy purse, he went again up to Yokohama to begin business in the silkworm-egg card export, which was in fashion at the time. This venture fit the market and the business grew day after day. However, in 1870 as the Prussian-French War broke out, the export to France, the largest market of silkworm-egg cards, was cut off. As a result the price of the goods fell drastically and most of the dealers in the trade were ruined. Fusajiro Kanematsu could not tide the difficulty either.

Penniless Fusajiro was thinking over one day the facts of reality and came to the conclusion that it would be much better to spent time studying for the future rather than to pass the time in irritation, and decided to learn English from Mr. & Mrs. Ballagh. This was an American missionary couple who had come to Kanagawa in 1861 and was giving lectures on the Bible, in uncertain Japanese, to inhabitants of the region. Together with a small number of classmates, Fusajiro attended the warm-hearted lessons of this couple. The following year, as a foreign language school was opened in Yokohama, he enrolled at this school. In addition to that, he learned English one time from Yajiro Ito who was then the chief officer in the Bureau of Mining.

In February 1872, he left Yokohama and went back to Osaka, where he looked for a proper business and at one time he made a plan to go to America which did not realize. Kanematus's fate was suddenly change, however, when he met his former English teacher, Yajiro Ito, on the boat bound for Kobe. After having criticizing his indecisive attitude, Ito recommended him to the Osaka office of the Mitsui Gumi Exchange, the predecessor of the Mitsui Bank. In March 1873, at the age of twenty-eight, the ex-successful merchant Fusajiro became an employee of the Mitsuis. Thus the Mitusi career of Kanematus began and lasted until November 1881. Although at first his position was not much different from that of an apprentice, he did not care for that matter, being the office for his hard work two hours earlier than other people. Gradually his honest and untiring attitude in work was recognized and by the end of the third year he was promoted to the position of an officer. When he resigned from the Mituis, Kanematsu was sitting in the seat of a director of the Osaka office.

While working for the Mitusis, Kanematsu made every effort to promote business in Osaka. In 1876 he endeavored to establish a rice exhcange in Osaka and on

behalf of Motonosuke Mitsui he became a supervisor of this exchange. In 1878 he joined the establishment of the Chamber of Commerce and acted as one of its officers. Through these activities in and out of banking, Kanematsu's name came to be widely known in the business community, but he was not satisfied with the status of a hired banker.

Soon after the resignation from the Mitsuis, Kanematsu joined the establishment of the Osaka Shosen (Merchant Marine) Company. According to *Osaka Shosen Kabushiki Gaisha Hachijunen Shi* (Eighty Years History) (1966), when he was turning his mind to shipping, the situation of the industry was in chaos, for "in the shipping industry of the inland sea which had developed mainly in Osaka and Kobe, because of the scarcity of working capital, shipowners were prompt to seek for daily profit and frequently alternated competition and alliance." With the purpose of improving this situation, some leading businessmen of Osaka made an agreement with each other to unite the competing shipping companies to form one consolidated shipping company, and Saihei Hirose, who was then the president of the House of Sumitomo, was recommended as the organizer. Kanematsu's relation with the rice exchange and the Chamber of Commerce brought him to participate in this project, and with the formation of the "Osaka Shosen" in May 1884, he was appointed director in charge of transportation. Nevertheless, in two years he resigned from the company. The emergence of opposition among the directors, which was often the case in such consolidated companies as the "Shosen" formed with competing enterprises, must have been the main cause for his resignation.

The next venture in which Kanematsu found an opportunity was a news paper. Cooperating with Tomie Teramura, who acted with him when he resigned from the "Osaka Shosen," Kanematsu bought the "Osaka Nippo" (Daily News) which was then in financial difficulty, and entrusted its management to Toru Yano, the principal of a commercial high school. Kanematsu's purpose of the purchase of the news paper was said to publish business news based on the business community of Osaka. In 1888 the reorganized news paper began to be published under the title of the "Osaka Mainichi Shinbun", but before that Kanematsu had already launched out toward direct trade with Australia destined to be his life work.

III. Bound for Australia

In November 1887, Fusajiro Kanematsu was on the deck of a ship bound for Australia. His purpose of this voyage was to survey the possibility of direct trade with Australia.

Since he became the supervisor of the rice exchange in 1876, he came naturally to be interested in the export of rice. In fact, from that time on, rice was becoming

one of the most promising export goods. For example, the ratio of rice in the total exports of 1882, 1884 and 1886 was 4.38 per cent, 6.41 per cent and 6.75 per cent respectively. Although the main customer of rice at the time was England, he noticed that, together with Germany, Australia was growing to the second largest rice market. Having been attracted by this fact, he studied more about this country and found that Australia was the world largest wool producing country as well as a country endowed with rich natural resources. *Old Mr. Kanematsu* describes his state of mind at the time as follows.

"Hereupon, he thought attentively. 'Our commerce and industry are still at an immature stage. Even though we have one or two cotton spinning enterprises, their output is almost unworthy of counting..... Nevertheless, the demand for cotton yarn is increasing so rapidly that there is no doubt that the cotton spinning industry will rise sooner or later. The next industry which is likely rise after cotton will be the wool industry. But once the wool industry rises, we will immediately be short of wool for production. If such a situation arises, now is the best time for opening direct trade with Australia. If we export rice and other goods in return for wool, it will lead to the promotion of our national wealth to a large extent..... From now on, I am going to devote myself to the trade with Australia.' "

In December of the same year, Kanematsu arrived in Sydney and spent about half a year for the survey while touring various places in the country. Although at that time the population of Australia was less than three million and the amount of trade with Japan had just reached the five hundred thousand yen level, the prosperous commerce in Sydney and Melbourn as well as the richness in live stocks and natural resources gave Kanematsu the impression that the future of trade with this country was far more promising than had expected.

In mid 1888, Kanematsu left for home with high expectations. When the ship stopped at Hong Kong, he ran across a young man named Toranosuke Kitamura. This youth was the son of a druggist in Kyoto, but when he was a little child his father died, and when he was eighteen years old or so Kitamura went over to Hong kong, engaging in commerce for several years with Chinese merchants. Kanematsu soon recognized the business ability of this youth, so, having told him about his plans, Kanematsu asked him for assistance, and Kitamura agreed to become his right-hand man. In fact, as we will see later, the acquisition of Kitamura was one of the most important by-products of this tour.

IV. Birth of the F. Kanematsu Japan-Australia Trading Co.

As soon as he came home, Kanematsu began to establish an enterprise for the direct trade with Australia by asking widely his acquaintances and friends for co-

operation. They looked, however, upon his undertaking as too risky. As has been mentioned before, it was the time that more than 90 per cent of trade was handled by foreign merchant houses in the settlements and many people thought it impossible to run foreign business without the intermediary by foreigners. In addition to this, the trade with Australia, which Kanematsu was going to undertake, was still almost unknown field of business. Therefore, it was rather natural for Kanematsu's friends to have been reluctant to assist him in finance. According to *Old Mr. Kanematsu,* they opposed to his attempt by saying: "He is now in a respectable position in the business community and his annual income is not small. Furthermore, it is a time of rapid economic progress, therefore not only are there ventures which should be undertaken domestically but also we can have a bright future by simply sitting and waiting. We can not understand why he dares to undertake such a tough business." And it was said that "when they came to see that they could not convert his mind, they shut their mouth, and even there were some who went so far as to declare to break off friendship with him."

Despite these adverse circumstances, Kanematsu's will to stick on the business was solid enough. In an attempt to begin the business even alone, he sold his building and lot in down town Osaka as well as his owned stocks, making about ten thousand yen. In April 1889 he sold "Osaka Mainichi Shinbun" to acquire additional funds. Meanwhile, financial assistance came from Saihei Hirose and some other business friends. By agreement, they were to loan him up to twenty and several thousand yen. Adding his own yen to this borrowed money, he could finaly raise about thirty thousand yen, enough as initial business funds.

The next problem he faced was where the business headquarters should be located, but without hesitation he chose Kobe. His choice was appropriate for his business because the position of Kobe as a trading port was rapidly rising. Taking the ratio of Kobe Port in total trade in Japan, for example, it increased from about 23 per cent in the years 1884–1886 to more than 33 per cent in the years 1888–1889, and nearly 40 per cent in import alone in the latter period.

On August 15, 1889 he opened the Kanematsu Company at Sakae-machi, Kobe. It was a small shop with a fifteen feet frontage and a thirty feet depth, and as to the employees, there was only one clerk except Toranosuke Kitamura, the right-hand man of Kanematsu. Nevertheless, as if to demonstrate his ambition, a huge signboard with "THE FUSAJIRO KANEMATSU JAPAN-AUSTRALIA TRADING CO." was proudly hanged up on the top of the shop-front.

V. Opening of the Sydney Branch and Direct Import of Wool

Following the establishment of the Kanematsu Company in Kobe, in order to

"sell Japanese goods in Australia and import Australian goods to be sold in the domestic market," it became an urgent need to have an on-the-spot branch office to operate as another base for the trade between the two countries.

On January 14 of the next year of the opening of the shop, Kanematsu and Kitamura got on board the S.S. *Tsinan,* leaving Kobe for Australia. As the branch office was opened, Kitamura was to reside there. According to *Old Mr. Kanematsu,* one day on board, Kanematsu asked Kitamura to swear an oath. "By chance, I have come to share the business with you, therefore, success or failure will depend upon the decision of both of us. I would, therefore, like to propose you the following conditions: (1) Don't take tea for three years after arriving there. (2) Every meal is to be limited to only one dish of Western food. (3) Carriages for transportation are prohibited. (4) In the office, clothing must be changed to working clothes. (5) Be contented with the same work as that of a longshoreman, and except in inevitable cases, don't hire a longshoreman. Can you follow these five clauses? I have already made up my mind, but I don't want to compel such hard things upon others. Consider carefully and tell me yes or no." Having thought over for a while, Kitamura readily consented.

In spite of neither being familier with the business practices and customs in the region nor having reliable channels of information, as early as the end of the month they arrived, the Sydney branch of the Kanematsu shipped the first cargo consisting of 29 barrels of tallow and 321 sheets of cowhide, then in May, 187 bales of cleaned wool was shipped, followed by the cargo of sheepskin, harness, cowhide and bark in the next month. In return for these goods, such goods as earthern wares, lacquer wares, bamboo wares and other oriental sundries were brought there by ship.

The above mentioned 187 bales of wool were the goods the Kanematsu's Sydney office had purchased for the Osaka Keito Boseki (Wool Spinning) Company on the Royal Wool Exchange at the assorted price of less than one pound eithteen pence, and this became the first Australian wool imported by the Japanese. Naturally, even before this shipment, Australian wool had been imported to Japan. In an attempt at the self-supply of woolen products, the Meiji government had established in 1879 the Senju Seijujo (Wool Manufactory) in Tokyo, which was the first modern wool factory in Japan introducing European techniques for wool manufacture. Knowing that the Chinese wool, which had been imported through the Chinese legation, was unsuitable as material for woolen cloth, the government had decided to use Australian wool instead and ordered the buying-in to Kihachiro Okura. Since then, the Okura-Gumi (Company) was providing the Senju Manufactory with Australian wool. However, the wool was imported by foreign merchants and the Okura-Gumi functioned only as a middleman.

The Osaka Wool Spinning Company, which first bought the wool Kanematsu

imported, was one of the enterprises coming into existence in the formative era of the woolen industry in Japan. Although the establishment of the Senju Wool Manufactory by the government in 1879 led to emergence of the other commercial wool factories, most of them were small sized enterprises with only one spinning machine and few hand looms. In around 1887, however, there appeared a small number of wool factories installing to some extent modern production modes. Among these enterprises was the Osaka Wool Spinning Company, which was organized in 1888 with a capital of 100,000 yen. Despite applying Australian wool imported by the Kanematsu, this company "did not have sufficient experience in equipment and could not realize any profits." In addition to this, affected by the panic of 1890, the company was forced to go into liquidation.

Turning back to Fusajiro Kanematsu himself, he could feel in Sydney that at least the base for the direct trade with Australia was completed, then, trusting future affairs to Kitamura, he came home to Kobe on August 15 in 1890.

VI. Fixation and Development of the Direct Japan-Australia Trade

While he could see a gleam of success, Kanematsu had to face and overcome further problems before fixing and developing his explored direct Australian trade as a business.

Since his second visit to Australia in 1890, Kanematsu had been there three times by 1893, and when a wave of crisis rushed over Australia in that year, he was at the new office in the Albert Building on O'Connel Street in Sydney to which he had removed the office in 1891. The Sydney Branch of the Kanematsu Company was also involved in the crisis, falling into unprecedent difficulties. For, until 1915 when a Japanese bank (the Yokohama Specie Bank) opened its branch office in Australia, Kanematsu had to use foreign banks. Under the depression, he could neither collect bills of credit sales nor convert goods such as rice or groceries into cash. Meanwhile, the due date of bank loans was approaching fast. Again according to the *Old Mr. Kanematsu*, tough as he was, Kanematsu could do nothing but "in excessive desperation and having no other course open, try to drive out agony by relying on the effect of spirits such as brandy or whisky." But one day, Kanematsu determined to call on his bank. In uncertain English, he appealed to the manager for what he had in mind as follows.

"Although the trade with your country has not yet reached a mature stage, I believe that I, Fusajiro, have done my bit for what it is today. Throughout the years since I started this business, with an inflexible will, I have devoted myself to the business, but yet I have never had any ambitions but to promote the development of trade of both countries. Nevertheless, in this great crisis, if you insist on the col-

lection of my notes on due date, I shall have no other way than closing the Kanematus Company with much regret. If it turned out to be so, the trade, which has been developed with great pain, will be aborted. I beg you understand what I really mean and take generous measures for the sake of the trade between Japan and Australia."

The appeal expressing his true feelings might have moved the manager. The bank gave grace to Kanematsu. Meanwhile, the crisis was over and business conditions improved, and the Kanematsu Company, whose bankruptcy had once seemed inevitable, could barely keep alive. As the situation became normal, Kanematsu returned home in February of the next year, but it is said that when his friends saw him at the port, his appearance with worn out shoes and clothing was so depressing that they could not say anything but watching him in silence.

In 1901, eight years after the crisis he had met in Sydney, the Kanematsu Company was again involved in a storm of crisis at home. By this year, the business of the Kanematsu Company had greatly expanded. In 1898, the company removed its office from Sakae-machi to Kaigan-dori and opened a branch office in Tokyo. Following the beginning of the silk yarn trade, the company started trade with China, though this was based on the consideration to secure additional business because he knew that Australia was a country apt to suffering frequently from natural disasters such as drought. The business volume of the company also increased from around 60,000 yen in 1890–1891 to the 1,000,000 yen level after 1898. The number of employees including Fusajiro himself came to count 36 (27 in Kobe, 5 in Tokyo and 4 in Sydney) at the end of 1898. When the Kanematsu Company expanded to such extent, there occurred a crisis beginning with a panic in the Tokyo Stock Exchange. Immediately the banks that had been providing the Kanematsu with almost unlimited credits began calling for the repayment of the loans. Thus Kanematsu was again in difficulties.

On this occasion, Fusajiro called on Yuboku Yamakawa, the manager of the Kobe Branch of the Tokyo Specie Bank, though he did not have a special business connection with this bank. Submitting precise inventories, he asked Yamakawa for financial support. Yamakawa did not only see the inventories showing that there was room for relief, but he also appreciated the painful situation of Kanematsu who was making every effort for the development of direct trade with Australia, and so he decided to give relief to the Kanematsu Company. Then, accepting the suggestion of Yamakawa, Kanematsu took action to reduce the size of business, including the abandonment of the speculative silk yarn business, the reduction of the Chinese trade and personnel reduction as well as wage cuts. At the same time, renting his huge house to a foreigner, president Kanematsu moved to a tiny rented house.

As shown in the foregoing, while Kanematsu's main effort was devoted to the

operation of his enterprise, his eyes were never focussed only on his own business. For example, in the middle of the 1890's he became one of the promoters who persuaded the members of the Trade Association, the Chamber of Commerce and the Municipal Assembly to organize the "Kobe-ko Shuchiku Kiseikai" (Society for the Improvement of Kobe Port), and as the vice president of the society, Kanematsu took the initiative for the improving movement of Kobe Port. It was also in those days that Kanematsu tried to unite wool manufacturers to realize the exemption from the five per cent custom duty for imported wool. Working on the Finance Minister, the Minister of Agriculture and Commerce and Diet members, he made every effort for the benefit of wool manufacturers. As the result, the duty on imported wool, together with that on cotton, was exempted after April 1 in 1896. It was felt in the wool industry that this government decision was the result of Kanematsu's efforts, and the four wool manufacturers decided to send a letter of thanks to him.

As if responding to the positive activities of Kanematsu in and out of the company, the surrounding situations turned favorable for his business. Taking advantage of the Navigation Subsidy Law in March 1896, the Nihon Yusen (Mail Steamer) Company came to open a route to Australia and assigned to it the *Yamashiro-Maru* as the first ship. In 1897 the Japanese consulate was set up in Sydney and was promoted to a consulate general in 1901. In 1899 a treaty revision was carried out, by which the extraterritorial rights of foreigners were removed, resulting in the disappearance of the notorious settlements. In 1911 a second revision of the treaty was executed, by which the custom sovereignty of Japan was restored. Thanks to these measures which created favorable conditions for his business, there was a steady growth of the wool industry.

As has been shown in the foregoing, the Japanese wool industry began with the establishment of the National Senju Wool Manufactory in 1879 followed by the emergence of private wool enterprises. Since then it had grown rapidly due to several events such as the Sino-Japanese War in 1894–1895, the repeal of the import duty for wool in 1896, the heavy raise in import duty for woolen products in 1899 and the Russo-Japanese War in 1904–1905. There is no doubt that these events gave stimulus to the wool manufacturing industry and eventually contributed to widen the market for wool imported from Australia.

Responding to these changing situations around the Kanematus Co., the business volume of the company increased year after year, though the figures are available only for the national level. As seen in the following table, around 1887 when Kanematsu first visited Australia, the total amount of the Japanese trade with Australia was on the 500,000 yen level. It increased, however, with a high tempo to the 1,000,000 yen level in 1892, the 2,000,000 yen level in 1897, the 4,000,000 yen level in 1902, the 10,000,000 yen level in 1907 and the 20,000,000 yen level in 1912. Al-

Value of Exports from Japan and Imports from Australia, 1887–1912
(In thousands of yen)

Year	Exports	Imports	Total
1887	535	32	567
1892	732	273	1,005
1897	1,875	897	2,772
1902	3,172	1,672	4,844
1907	4,794	7,819	12,613
1912	8,629	12,792	21,421

Source: Division of Research of the Kanematsu Co., *Goshu* (Australia), 1943.

though the figures show that the total amount doubled every five years, the increase in wool was conspicuous as the highest among the traded goods. In the fiscal year 1890–1891 when the Kanematsu first attempted to import wool, the total volume of wool imported to Japan was only 200 bales, which increased to 10,727 bales in 1904–1905 when Japan was fighting with Russia, and reached 25,550 bales in 1911–1912. Of course, this rapid growth of the Australian wool trade was not brought about by the Kanematsu Co. alone. Since around 1907, in an attempt for similar luck as that of Kanematsu, there appeared some Japanese trading firms engaging in the Australian wool trade. Thus Takashimaya-Iida in 1905, Mitsui and Okura in 1907 began to buy wool on the spot. According to the *Sixty Years Retrospect of Kanematsu*, the share of the Kanematsu Co. in the total Japan-Australia wool trade was as high as 58.0 per cent in the fiscal year 1909–1910, 65.5 per cent in 1910–1911 and 63.9 per cent in 1911–1912.

In the summer of 1911, as if symbolizing the success in the direct trade with Australia, a new building of the Kanematsu Co. was completed. It was built on the site of the old house which had been used for the company's offices. The new building was made of stone and had three stories, which Fusajiro, filled with deep emotion, named the NICHI-GO KAN (Japan-Australia Building).

In August of the next year, the Kanematsu Company changed its legal form from that of the original sole proprietorship to a dormant partnership to realize the business ideology of the owner. That is, Fusajiro had long held the belief that a business should not be owned by one proprietor alone, but owned cooperatively with its employees. As early as 1899 he expressed his intention to give a part of shares to employees, then in 1906 he made an agreement with them, by which, half of the capital of 120,000 yen was to be held by the employees and the dividends to be paid from the revenue in each fiscal term. The change of the company's organisation in 1912 aimed to put into legal form a share holding system by his employees by making his 18 employees including Toranosuke Kitamura dormant partners as provided by the Commercial Code.

On February 6 in 1913, Fusajiro Kanematsu died of illness at the age of sixty-eight. Once the news on his death crossed the ocean to reach Sydney, *the Sydney Wool and Stock Journal* carried an article entitled "Wool Trade with Japan" and praised his achievements as a pioneer in the wool trade between Japan and Australia.

VII. Conclusion

We have seen in the foregoing chapters the various entrepreneurial activities of Fusajiro Kanematsu. Among his activities, however, the most impressive thing was that Kanematsu, who was over forty years old and in a quite stable position in society as well as in business, bravely challenged to an unknown enterprise such as the direct trade with Australia. In the final chapter of this paper, we shall review what Kanematsu drove to such a venture and what the source of energy for his enterprising activities was.

It is true that Kanematsu was attracted by the wealth which might be realized if he were fortunate enough to succeed in his attempt. Nevertheless, we should regard it neither as the only motive to drive him into the venture nor as the prime one. If he had pursued only his own private fortune, would he have excuted such a plan as to give half of the capital to his employees? We can not deny the profit motive in his behavior, but we must not take it for his sole and prime motive. Rather we like to think that what led him to the venture was his strong desire for self-expression. As has been mentioned before, the desire for something was always in his blood. In addition, the adverse circumstances, in which he was placed immediately after his birth, must have strengthened his desire for achievement. The fact that he had changed apprenticeships so often and even bought the title of a samurai can be taken for the evidence to support our assumption. Similarly, that he hung up the huge sign board of "THE FUSAJIRO KANEMATSU JAPAN-AUSTRALIA TRADING CO." on his office even though it was a tiny shop with two clerks seems to be based on the same desire.

Then, in order to achieve his goal, why did he choose the direct trade with Australia? What did he find in it to satisfy his desire?

As has been pointed out, Japan's foreign trade was controlled by nearly 90 per cent by foreign merchants even in the later part of the 1880's. It could not be helped at the time when the Japanese were unfamilier with foreign affairs, but the result was the monopolization of trading profits by foreigners. Meanwhile, among the Japanese merchants in Kobe as well as in Yokohama, a movement to break down the evils associated with the settlement-trading took place, but as long as the Japanese merchants were confined themselves in the position of middlemen, there were natural limitation beyond which they could not proceed. In order to establish the sovereign-

ty of commerce, it was indispensable to break bonds with the foreign merchants, and it was not only the earnest wish of the merchants in open ports but also that of the Japanese people led by the government policy to enrich and strengthen the country. What moved the mind of Kanematsu was no other than such a situation. If he attempted direct trade with foreign countries, especially in an unknown field, he would win applause.....this belief drove him to such a venture as the direct trade with Australia.

PRODUCTIVITY BARGAINING AND THE CHANGE OF LABOUR MANAGEMENT RELATIONS IN THE JAPANESE FOREIGN-GOING SHIPPING; 1965-1975

Hiromasa YAMAMOTO

In Japan it was a well-known fact that the seamen's union and foreign-going shipping companies had maintained harmonious relations between them. It was also regarded that the seamen's union was conservative in its character both in trade union policy and in political activities. Accordingly it was a surprising fact that in 1972 the seamen's union struck for three months demanding the improvement of wages and other items. The strike of 1972 symbolizes the change of labour management relations in the Japanese foreign-going shipping.

In this article the writer intends to trace the main issues of collective bargaining of the industry and reveal the process and reasons why the labour management relations changed.

I. Productivity Bargaining and its Aftermath

During two decades after World War II there were harmonious labour-management relations in the Japanese shipping industry. On productivity bargaining it was not an exception. The All Japan Seamen's Union decided at the fourteenth National Convention of 1955 to co-operate with management in the program of improving labour productivity, in sharp contrast with the left-wing union policy which made clear their resistance to the program in many other sectors of industry.(1)

In April 1961 the union agreed with the remedy of the manning clause for ocean-going vessels. The trade agreement before the remedy defined that the complement was to be determined according to standards such as gross tonnage, horse powers of the main engine and also areas in which the vessel would operate, without any regard to the volume of work to be performed on board ship or to the degree of utilization of labour saving devices. The new agreement on complement, abolishing the old standards by which the manning scale had been set, defined that companies might decide unilaterally the number of crew of respective company vessels in consideration of the volume of work under the premise of an eight hour work day and

(1) H. Yamamoto, "Technological Development and Labour Relations in the Japanese Shipping Industry," *Kobe Economic and Business Review*, No. 13, 1966, pp. 66–68.

preventing daily overtime work. Conflicts concerning the complement were to be dealt with according to the ordinary grievance proceedure.

The new agreement on complement gave shipping companies an opportunity to reduce the complement and crew costs. In addition, by the revisions of the laws and regulations on complement in 1962 and 1963, shipping companies were no longer required with some exceptions, to have a doctor on foreign-going vessels. They were also able to reduce the number of radio operators on foreign-going vessels from three to one as long as the governmental regulations were concerned, though the actual complement had to be determined by negotiation with the union.

After the new agreement on complement became effective, shipping companies carried out actively the building and replacement program of company fleets so as to decrease the number of crew and crew costs. In 1960 the complement was forty-eight men in case of a cargo ship of 10,000 gross tons. In 1970 there were thirty men or less in case of an automated cargo ship of the same size. Table 1 shows the development of the Japanese foreign-going fleet and the change of seafarers' employment during the period from 1962 to 1973. During the period the tonnage of the Japanese foreign-going fleet increased by 36.52 per cent while the total number of crews was reduced by 11.7 per cent. The number of seafarers who were employed by foreign-going shipping companies showed little change during the same period, because the impact on employment due to automation and growing size of vessels were counteracted by the increase of paid vacation and shorter working hours which

Table 1. Tonnage of Japanese Foreign-going vessels and Employment of Seafarers, 1962 and 1973

Bargaining Group		Gaiko Romu Kyokai(1)			Chuso Senshu Romu Kyokai(2)		
year		1962	1973	Rate of increase 1973 over 1962(%)	1962	1973	Rate of increase 1973 over 1962(%)
Tonnage of foreign-going vessels (1,000 G.T.)	(A)	4,301	22,390	420.6	2,113	7,448	252.4
Total Number of Crews	(B)	20,337	17,595	13.5	14,751	13,324	9.7
A/B	(G.T.)	212	1,273	501.7	143	559	290.1
Officers	Deck Dept.	2,715	3,437	26.6	1,978	2,477	25.2
	Engine-Room Dept.	2,887	3,429	18.8	1,904	2,434	27.8
	Radio Dept.	1,728	1,590	8.0	1,193	1,135	4.9
Ratings	Deck Dept.	7,623	7,403	2.9	5,481	5,187	5.4
	Engine-Room Dept.	6,748	5,857	13.2	4,736	3,990	15.8
	Catering Dept.	3,814	3,922	2.8	2,474	2,634	6.5
Total		25,515	25,638	0.5	17,766	17,857	0.5

(1) Bargaining Group of 19 large shipping companies.
(2) Bargaining Group of small shipping companies.
Source; the All Japan Seamen's Union, *Senin Chingin-kozo Chosahyo and Data of the G. R. K.*

the seamen's union got by bargaining.[2]

However, the program for improved productivity, as it developed, caused disappointment and discontent among union members towards employers and also towards the union.[3] When the union determined the co-operation with management for the program, the union promised its members to secure their employment and to get larger wage gains than before. But in reality the expectations of union members were not always satisfied. Indeed, the union succeeded in preventing un-employment which might occur, but the union failed to satisfy its members' expectation on higher wages.

During the sixties most industries in Japan experienced a boom and unions in those industries got considerable wage gains through yearly collective bargaining. In contrast Japanese foreigh-going shipping had suffered from growing losses until 1967, which led to the amalgamations of shipping companies in 1964 under the strong guidance of the government. In those slump years the seamen's union refrained from demanding yearly wage increases and got moderate wage gains through bargaining. Under those circumstances there appeared dissatisfaction among union members that they were not rewarded adequately notwithstanding their cooperation in the program for improved productivity. Those feelings were especially strong among radio operators and engine-room ratings whose chance of promotion were delayed by the introduction of the new formula of complement. Revolts of the rank and file against the seamen's union occurred in the following years out of such deep-rooted feelings. After the seamen's strike of 1966 a radical group in the union tried to recall the main union officials, contending that the union members had got few advantages from the co-operation in the program for improved productivity and that the union officials had not done their best to get acceptable gains for their members.[4] Though the recall movement did not succeed, the open criticism of the union officials cast questions to union members how to appreciate union policy. In 1968 another incident occurred in the union. In the preceding year the union agreed with shipping companies to decrease the complement of radio operators on board foreign-going vessels from three men to two. Early in 1968 a disappointed fraction of radio operators resolved to withdraw from the seamen's union and to establish a new organization, which was realized in 1972 with few memberships of craft basis[5].

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(2) H. Yamamoto, "Available Jobs and Employment in Japanese Foreign-going Shipping," *K. B. E. R.*, No. 20, 1973, pp. 52–56.

(3) H. Yamamoto, "Technological Development and Labour Relations in the Japanese Shipping Industry," pp. 69–70.

(4) I. Numata and H. Sasaki ed., *Kaiin-sogi to Kaiin-Kumiai* (Seamen's Strike and the Seamen's Union), 1972, Rodo Junpo-Sha, Tokyo, pp. 137–41.

(5) *ibid.*, pp. 117–21.

The rank and file of the seamen's union revolted in 1971 against the union officials. Favored by the boom in the shipping market and the financial assistance from the government, the Japanese foreign-going shipping had recovered from a long slump lasting up to that year. Therefore, upon the renewal of the trade agreement the seamen's union demanded from foreign-going shipping companies a wage increase of 22.4 per cent and shorter work hours. In April, after three months' negotiations without strike, the union concluded a provisional agreement with foreign-going shipping companies, in which the union got wage increases of 14.4 per cent. Immediately after an extraordinary occurrence emerged in the union. The caucus of the union did not allow the executive committee to conclude the formal trade agreement, by reason that the wage gains were too small to recover the adaquate level of seamen's wages which had fallen during the slump years of the shipping industry, and that the executive committee had not done their best in the negotiations. In June an extraordinary national convention was held, and there the members of the executive committee were newly selected, though the provisional agreement was recognized to be formal and effective in the duration of the agreement.[6]

Reflecting the desire of the rank and file, the new executive committee was very active in wage bargaining, and in 1972 the seamen's union struck for three months to get favorable wages and working conditions. At the same time the union took a very cautious attitude toward productivity bargaining. The union discontinued the experiment on interchangeability of crews which had begun on several container ships.[7] In the tripartite committee on vocational education for seafarers the union made clear its reluctance to introduce in the near future[8] general purpose crews on board ships.

Under such conditions the harmonious relations between the union and the employers came to an end. The shipping companies could hardly expect the co-operation of the union in the program for improved productivity. They had to search for new devices to decrease the operating costs of their fleet so as to compete in the world market.

II. Chartering Activities—New Type of Program for Improved Productivity

After the seamen's strike of 1972 the Japanese shipowners sold out vessels of considerable tonnage to foreign shipowners, because the vessels became, according

(6) *ibid.*, pp. 111–15.

(7) and (8) H. Yamamoto, "Bengi-chiseki-sen to Senin Mondai" (Flag of Convenience and Seamen's Unions), *Keizai Keiei Kenkyu Nenpo*, Kobe Univ. No. 24(1), 1974, p. 162.

to the explanation of shipowners, unprofitable due to increasing crew costs. While tonnage of vessels sold abroad were one million and 1.1 million deadweight tons in 1970 and 1971 respectively, the vessels sold out abroad incereased rapidly in 1972 and amounted to 2.34 million deadweight tons.[9] Most of them were old vessels of less than 8,000 gross tons, but among the vessels which were sold in 1972 were conventional cargo liners and lumber carriers which were under five years of ship-age.

When the seamen's union made a research about the sales of Japanese vessels to foreigners, the union found out that part of these vessels were manned by Asian crews under flags of convenience, and chartered back again to the old proprietors. The union condemned Japanese shipowners saying that "the chartered back vessels" can not be considered as ordinary chartered vessels but are plotted beforehand by the Japanese shipowners so as to escape the Japanese registry, and that their practice was harmful to the employment and wages of Japanese seamen.[10] The union began to check the sales of Japanese flag vessels to foreign shipowners, as will be described later.

In the course of their research the union made it clear that there was another practice by the Japanese shipping companies to make use of low cost vessels of foreign registry. When a Japanese shipowner desires to charter a foreign vessel over a long period, he may make foreign shipowners, whose vessels are operated under

Table 2. Foreign-going Vessels operated by Japanese Shipping Companies

(1,000 D.W.)

year	Japanese-flag foreign-going vessels (A)	Vessels chartered from abroad (B)	Total (A)+(B)	(B)/(A)+(B)	Annual rate of increase (%)			
					(A)	(B)	(A)+(B)	Import
1962	10,006	.....	10,006	.....	.....	.....	9.3	3.8
1963	10,360	770	11,130	6.9	3.5	.....	11.2	19.8
1964	10,655	1,768	12,423	14.2	2.8	129.6	11.6	20.2
1965	12,082	2,360	14,442	16.3	13.4	33.5	16.3	14.7
1966	15,022	3,073	18,095	17.0	24.3	30.2	25.3	15.3
1967	17,387	3,581	20,968	17.1	15.7	16.5	15.9	24.0
1968	21,281	4,493	25,774	17.4	22.4	25.5	22.9	16.0
1969	25,627	5,349	30,976	17.3	20.4	19.1	20.2	17.3
1970	19,444	11,062	40,506	27.3	14.9	106.8	30.8	20.7
1971	33,948	17,011	50,959	33.4	15.3	53.8	25.8	4.6
1972	39,038	18,952	57,990	32.7	15.0	11.4	13.4	4.8
1973	45,326	27,700	73,026	37.9	16.1	46.2	25.9	.....

(1) at 1st of April of the year.
Source; the Japan Shipowners' Association, *Kai-un Shiryo,* No. 113, Sept. 1973.

(9) based on the figures of the Japan Shipowners Association.
(10) For example, refer to "Senin Shinbun" (Newspaper of the All Japan Seamen's Union), Sept. 21, 1973.

Table 3. Foreign Vessels chartered by Japanese Firms

Terms of Charter / year	Time charter longer than 6 months		Voyage Charter and Time Charter shorter than 6 months		Total	
	No. of Vessels	Tonnage (1,000 D.W.)	No. of Vessels	Tonnage (1,000 D.W.)	No. of Vessels	Tonnage (1,000 D.W.)
1960	101	1,157	19	181	120	1,338
1961	70	979	72	917	142	1,896
1962	74	1,087	36	600	110	1,687
1963	51	1,030	44	553	95	1,583
1964	104	1,744	38	643	140	2,387
1965	126	2,523	76	922	202	3,445
1966	140	2,452	57	899	197	3,351
1967	137	2,853	123	1,740	260	4,593
1968	185	3,845	111	1,957	296	5,872
1969	238	5,368	61	916	299	6,248
1970	432	11,650	30	722	462	12,372
1971	578	17,519	14	307	592	17,826
1972	599	20,580	60	1,665	659	22,245
1973	678	25,920	33	785	711	26,705

(1) at the end of June of the year.
Source; Ministry of Transportation, *Kai-un Hakusho*, each year.

flags of convenience, build a new vessel of the necessary type under the conditions; that instead of the foreign shipowners he will secure the building slip which can deliver the vessel in due time and afford loans for shipbuilding if necessary; and that he will charter that vessel for a certain period at a predetermined charter rate. In this case the Japanese shipowner can secure a stable supply of vessels of a lower charter rate, and the chartered vessels may be regarded to be, in a sense, under the economic control of the Japanese shipowners.[11] In addition, it is believed that some of the large Japanese shipping companies have established foreign subsidiaries in order to operate vessels under flags of convenience.[12] However, it is, needless to say, quite difficult to ascertain whether or not some chartered vessels of foreign registry are under the economic control of the charterer.

If we put aside the problem whether or not there are hidden relationships between Japanese charterers and foreign shipowners, we can find a tendency that in recent years Japanese foreign-going shipping companies have increased the dependence upon the tonnage chartered from abroad. Though the tonnage of Japanese foreign-going vessels has shown a steady incerase, vessels which were chartered from abroad

(11) As for estimated cost comparisons between Japanese-flag vessels and chartered foreign-flag vessels under economic control by Japanese shipowners, see "Kaiun," Aug. 1973, pp. 12–13.

(12) "Senin Shinbun," Oct. 24, 1973.

have increased more rapidly and from 1970 onward they amounted to one third and more of the total foreign-going tonnage operated by the Japanese shipping companies. Here we should be reminded of the fact that from the late sixties the rank and file of the seamen's union began to criticize the union's co-operation with the program for improved productivity. This fact suggests us that in order to secure the necessary tonnage the Japanese shipping companies rather chose the chartering of foreign vessels instead of the construction of new company vessels, because of the fear of increasing labour costs of the Japanese-flag vessels.

III. Securing Employment—Dilemma of the Seamen's Union

As we have described already, the employment of Japanese seafarers were in stagnation and tended to decrease with the development of the program for improved productivity. When the shipping companies began to utilize chartered vessels from abroad on a large scale in their fleet operations and sold out a considerable tonnage of company vessels, the security of employment became the most serious task for the seamen's union to cope with. In addition to the effort to gain longer paid vacations and a shorter work week with which the union had tried to countervail the decreasing trend of available jobs, more radical steps were needed to secure employment. The first step that the union took was to check the sales of Japanese vessels to foreign shipowners.

After the strike of 1972 the seamen's union found that many Japanese vessels had been sold out to foreign shipowners. Being afraid that the sales of these vessels would decrease the available jobs for union members, the union proposed in September to the employers' association to hold a joint council on employment. The union also demanded to stop temporarily the sales and the laying up of vessels until a mutual consent would be attained on the problem. After several sessions of the joint council the employers' associations and the union concluded the agreement on stable employment in case of sales of vessels.[13]

The agreement contains the following points:

(1) when a shipowner desires the sale of company vessels, he will negotiate with the union on the problem of employment which may occur;

(2) the union will not object to sales of vessels if the following conditions are satisfied by employer,

(a) the employer will not dismiss the crew of the vessel concerned,

(b) in preventing the decrease of available jobs, the employer will take possible measures such as new construction or replacement,

(13) "Kai-in," (Union magazine of the A. J. S. U.), May 1973, p. 7–9.

(c) in case of sales to foreign shipowner, the Japanese shipowner will not charter it back again.

At the national convention of 1973, the seamen's union determined the program for securing employment of seafarers. The program included the following measures; to endeavor legislation of the relate acts in order to maintain the necessary tonnage of Japanese-flag vessels which enables the full employment of Japanese seafarers; to demand governmental regulations against ownership and economic control of "flag-of-convenience vessels" by the Japanese shipowners; to demand the improvement and reorganization of the educational system for seafarers including retraining; and to conclude a new agreement on employment with the shipping companies in order to secure full employment of the union members.[14]

In the above-mentioned policy, there are a few points which draw our attention. With regard to the ownership or economic control of flag-of-convenience-vessels by the Japanese shipowners the union did not take particular measures other than demanding legislation and governmental regulations against it. Also in actual union activities the union has not engaged in organizing foreign crews on board flag of convenience vessels.[15] The union has not explained the reason why it does not engage in organizing foreign crews itself. However, we may infer two possible explanations for this. One of the possible answers is that a boycott of handling cargo, which is the most effective means for organizing crews on board flag-of-convenience-vessels, may be judged illegal according to the labour legislation of Japan. The other is that the organizing activities against flag-of-convenience-vessels do not necessarily lead to the stoppage of chartering of low costs foreign vessels by the Japanese shipowners. For example, a Japanese shipowner can charter a foreign-flag vessel which is manned by an Asian crew at a low charter rate, if he charters it for extended period. In this case he can get the same advantage when chartering of flag-of-convenience-vessels.

In short, the seamen's union has no adequate means to check the shipowners' reliance on foreign vessels in their shipping operations. Efforts of the union to organise flag-of-convenience-vessels do not necessarily contribute to securing the employment of Japanese seafarers, though they are useful in the long run to improve the wages and working conditions of Asian crews and also those of the Japanese seafarers.

The next point which draws our attention is that the seamen's union did not refer to the program for improved productivity. It seems quite strange if we recall

(14) A. J. S. U., *Katsudo Hokoku-sho* (annual report), 1973.

(15) However, the seamen's union concluded trade agreement with employers of 53 "flag of convenience" vessels in order to secure the comparative wages and working conditions for Japanese seafarers on board those vessels in 1973.

the fact that the growing reliance of Japanese shipowners on foreign vessels has come out from the delay to implement the program for improved productivity. It is certain that the development of the program has some impact on seafarers' employment through the decrease of complements on board. However, the refusal to cooperate in the program and demand for higher wages, both of which has been the response of the union on productivity bargaing since 1972, seems to be more harmful to the employment of Japanese seafarers when we consider the problem in the long span of time. Because the attitude of the union toward productivity bargaining will weaken the competing power of Japanese vessels more severely than before. Even if the union succeeds in maintaining the present level of employment for a while without improvement of productivity, it is likely to cause unemployment on a large scale in the future.

So long as there are big differences of wages and working conditions among different countries, the merchant marines of developed countries have to specialize in vessels of more capital-intensive types and at the same time reduce complements on board ships through automation and reorganization of working systems in order to survive in the world market. Japan can not be an exception. In the process of transition it is inevitable to emerge that a certain surplus of labour will occure. Retraining for new jobs and other necessary measures should therefore be considered.

Therefore, it seems to the writer that the present policy of the seamen's union on securing employment is a risky stake for the future employment. Nevertheless, the revival of the union's cooperation in the program for improved productivity is unlikely so long as the bad feelings toward the program remain among the rank and file of the union. Under these circumstances the union seems to maintain a rigid and antagonistic attitude toward the employers.

ON AN INTERPRETABLE DEPRECIATION METHOD

Isao NAKANO

The purpose of this paper is to propose and evaluate a new depreciation method within the historical cost framework which will produce a clearly "interpretable" and potentially useful depreciation expense value for any period of time. We shall begin with a reference to Professor Thomas' statement about the impossibility of non-arbitrary allocations. And we will assert that taking a different view on the "matching" concept will free us from his "impossibility" proposition. We will also indicate the possibility that further research into cost allocation problems may not be *a priori* insignificant. Then, based upon this possibility, we will develop a proposal for a cost allocation scheme (depreciation) which is "interpretable", i.e., which has a clear semantic content within the confine of the historical cost valuation.

I. Are All Allocations Arbitrary?

Thomas claims that all financial accounting allocations are arbitrary, i.e., that they "suffer from logical defect of incorrigibility" in the sense that "there is no way either to verify or to refute" them (Thomas, 1974, p. 2) (Thomas, 1975, p. 38). And this alleged failure to theoretically defend a single (adopted) allocation scheme against all other alternatives is said to arise from the "interaction" of inputs to a business process in generating an output (Thomas, 1974, pp. 15–18). Flatly, verifiable depreciation calculation is impossible, he says, because machines and workers working together will produce more outputs than the total that these inputs would have produced working separately, so that there is no way to identify each input's contribution to the outputs separately for each period and hence over time, too (Thomas, 1974, p. 16).

Underlying the above argument is Thomas' matching concept that "cost of inputs should be associated with revenues (or cash inflows) in proportion to the contributions that these inputs make to them" (Thomas, 1975, p. 37). This is so, because the above-mentioned impossibility of determining each input's "contribution" makes this contribution-proportional matching unattainable.

I think his assertion is correct as far as the "contribution-proportional" matching is concerned. However, this does not mean that all possible allocations are bound to be arbitrary (i.e., incorrigible), because there is another matching concept and this latter concept seems to generate a verifiable allocation scheme, as we will show below.

II. On Sacrifice-based Matching

This latter matching concept I will call a "sacrifice-based" matching. To explain this, we will restart with an explicit interpretation of the conventional, historical-cost-based accounting measurement upon which we will build our matching concept.

In accord with a view by Rosenfield (Rosenfield, 1972 and 1975), accounting measurement is defined here as assignment of a number of units of a chosen "standard resource" (such as a monetary unit or some purchasing power) to an object with the view to representing a certain "relationship" between the measurement object and that standard resource. The "relationship" to be represented and reported differs depending upon alternative valuation schemes. In the conventional accounting system, the "relationship" is nothing but the "historical cost" which reveals the "quantity of the standard resource (unit of money in this case) sacrificed to obtain the resource" (Rosenfield, 1972, p. 65).(1) Therefore, in this interpretation, the generally accepted accounting principles (GAAP) dictate the use of the unit of money as the "standard" in order to represent the "relationship" between the measurement object and the units of the standard invested into the object, i.e., the "monetary sacrifice" incurred to obtain it. And the reason why GAAP adopts "units of money" and not a purchasing power as the standard, is interpreted as relating GAAP's adherence to a "criterion of success or failure of the firms (i.e., income concept) in terms of an increase or decrease in its holdings, command over or prospects of obtaining "money" over a period and not in terms of any purchasing power (Rosenfield, August 1975, p. 53).

From this interpretation emerges a matching concept relating acquired money to the money sacrificed to get it, or charging current revenue with costs of those goods and services which are deemed to have traceable "physical" relationships with the revenue, by the amount of the monetary "sacrifice" which can be considered as incurred to generate the revenue. Conceptually, to understand the differences between Thomas' "contribution-proportional matching" concept and our "sacrifice-based matching" concept, note Figure 1.

(First Stage) Emphasis on "economic" relationship versus on "physical" relationship between inputs (costs) and outputs (revenues).

As shown in Figure 1, production of output (sales revenue) for a certain period has, as a matter of fact, required consumption of a certain physical quantity of each

(1) Some alternative "relationships" conceived for other alternative valuation schemes are the following. (1) The quantity of the standard (i.e., money or purchasing power—the same in (2) and (3) below, too) that can be obtained in exchange for the resource (selling price). (2) The quantity of the standard that is required to replace the resource (replacement price). (3) The quantity of the standard that will be obtained in the future in exchange for the resource or its product (future net receipts). (Rosenfield, 1972, p. 65.)

of several inputs in the business process. (For example, consumption and/or delivery of certain quantities of inventory goods, and consumption of a part of the total productive capacity over the useful life of a plant asset). Such identified relationships between produced output and physical quantities of inputs consumed or delivered to generate the output shall be hereafter called "physical relationship". A unique characteristic of our "sacrifice-based" matching concept consists in isolating this "physical relationship" for a basis of cost allocations.

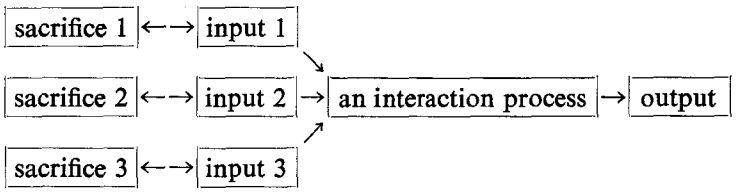

Fig. 1. A Simplified Business Process

The following five examples will serve to elaborate this concept of "physical relationships".

(Ex. 1) During the year, the firm has attained sales revenue of $1,000,000 by using a certain machine. This machine's total estimated productive capacity over its service life is equal to 50,000 units of a certain kind of product. And assume that the wear and tear from the use of the machine for this year brings about the consumption of its total productive capacity of 2,500 units of the product. Here, we find a "physical relationship" of the consumed (2,500/50,000=) 5% productive capacity of the machine corresponding to the $1,000,000 realized revenue.

(Ex. 2) Because of a sudden temporary physical breakdown and a decrease in operation hours of the machine during this period, we assume that the machine has incurred a loss of the productive capacity equivalent to 500 units of the product in addition to 2,500 units which have actually been produced. In this case, the perceived "physical relationship" may be said to exist between the sales revenue of $1,000,000 (the same as (1) above) and the total consumed and lost productive capacity of 3,000 units of the product.[2]

(Ex. 3) Let us consider a case of obsolescence. Assume that competitors begin to acquire and use a new, more profitable type of machine than this firm's and that this sudden obsolescence is expected to reduce the remaining service life of the latter machine by 3 years which is equivalent to a loss of its productive capacity in the amount of 7,500 units of the product. (No decrease in the product unit's contribution

(2) The 500 units' unproductive loss of the productive capacity may be considered related to the revenue in the sense of physical concomitance, i.e., that the loss has occurred simultaneously with the revenue.

to the net profit has occurred). Then, the physical relationship between the revenue of $1,000,000 (the same as (1) and (2) above) and the machine's total lost productive capacity of (2,500 (for productive use)+7,500 (because of obsolescence)=) 10,000 units' products is going to be used for cost allocation under our matching concept.

(Ex. 4) Assume that obsolescence has not only reduced the machine's remaining useful life by 3 years but has also cut down the machine's product unit's contribution to revenue. Specifically, the differences of the firm's machine's physical function from the new advanced machine in the market has made it necessary to sell 3,000 units of the firm's products in order to get the same revenue of $1,000,000 for this period. Were it not for the obsolescence, a sale of 2,500 units would have earned the same amount of revenue. In this case, we note that in the last analysis it is some kind of "physical difference" between the new and the old types (or kinds) of machines which generates the above difference in each product's contribution to revenue. (Ex., an improved quality of material composing the new machine which brings about a higher degree of precision in the size and/or other dimension(s) of the product therefrom; a completely different kind of products produced from the new machine which is attracting the demand formerly directed to the products of the firm's current plant assets). If we assume that this firm actually made 3,000 units of the product to get $1,000,000 revenue, then the above "physical difference" clearly pertains to the amount of revenue, in the sense that if no obsolescence had occurred in producing the 3,000 units, the revenue must have been $(1{,}000{,}000 \times \frac{3{,}000}{2{,}500} =)$ $1,200,000. Therefore, we can conclude that the revenue of $1,000,000 is related to the effective physical consumption of 3,000 units' productive capacity plus the ineffective loss of 7,500 units' capacity because of the sudden reduction of the service life plus the other certain "physical difference" between the old and new machines which cannot be expressed in terms of a different product unit number but which influences the realized sales revenues per unit. This "physical relationship" between the revenue and the physical consumption, loss and differences provides a basis for cost allocation in this case.

(Ex. 5) The above case (Ex. 4) assumed the possibility of identifying a new or improved type or kind of plant assets which is driving the firm's assets into obsolescence. But sometimes we may not be able to detect such competitor plants. In other words, not any specific competing plant but the general transition in customers' demands might be the cause for the profitability reduction of the firm's old assets. In this case, it is impossible to determine any physical difference between the firm's fixed asset and any superior asset in the plant market, because the latter cannot be identified.

However, we still believe that the cause(s) for the obsolescence of the asset can

be no other than some "physical factor(s)", such as the ill-adaptation of the physical quality or kind of the products from the asset to the changed customer demand. Such a state we shall call "physical irrelevance" of the old plant to the existing situation. Therefore, as far as we stick to the physical state of the assets as a basis for their cost allocations, our further task may be said to lie in evaluating this "physical irrelevance" (as well as productive consumption of the capacity of the asset) in terms of allocated costs.

Hopefully, the above examples will suffice to demonstrate the applicability of the concept of "physical relationships" to all conceivable situations. In the (Second Stage) below, we will attempt to outline a cost allocation scheme which is based on such "physical relationships."

In contrast to our emphasis on the "physical relationships" between inputs and outputs, Thomas' "contribution-proportional matching" concept naturally pays no direct attention to any dimensions of physical deterioration (or other changes) of the plant asset in allocating its total cost among periods. Rather, the net profit or cash flow to be generated by the asset (i.e., the output side) is said to directly dictate the pattern of the cost allocation. One of the most typical allocation procedures (the "implicit-rate approach") under this matching concept goes as follows (Thomas, 1974, pp. 13–14).

The accountant estimates the cash-flows associated with employing the input, then uses these, together with the input's purchase price, to determine its implicit (internal) rate of return. This rate of return multiplied by each year's beginning investment determines the amount of profit on the investment to be reported during each year. Amortization for a year is the arithmetic difference between the input's net cash inflows and its book profit for the year (Thomas, 1974, p. 12). Note the direct depedence of depreciation on the cash-flow. Such dependence we will call an "economic relationship."

As an example, a firm purchases a machine for \$13,773, in the expectation that it will generate contributions of \$5,000, \$8,000 and \$7,001 at the end of years One through Three, respectively. The implicit rate of return on this investment is approximately 20%. Table 1 (Thomas, 1974, p. 13) shows how depreciation is calculated under the implicit-rate approach. All book values given are as of the beginning of the year.

Thomas attacks the above depreciation policy in the following way. (1) He insists upon the arbitrariness of the assigning of a firm's total revenues or cash inflows for any year to its various inputs, i.e., the estimating of the machine's contributions of \$5,000, \$8,000 and \$7,001 because of the "interaction" of various inputs in producing output (Thomas 1974, pp. 15–17). (2) He claims that it is not persuasive to assume, as is done in Table 1, that the profit rate for each individual year remains

the same and is equal to the overall 20% rate of return for the three year project as a whole. He points out and partially demonstrates that "infinitely many individual-year rate of return patterns would be consistent" (Thomas, 1974, p. 14) with the overall rate of 20%. So, adoption of any single rate pattern signifies, according to Thomas, an arbitrary selection.

Thomas admits there are plural alternative cost allocation schemes other than the above-mentioned "implicit-rate approach" but he ultimately concludes they are all subject to some flaws which result in "arbitrary" allocations. I think this is a plausible conclusion in the light of the inevitable interaction of the inputs which arises from the adoption of the "contribution-proportional" matching concept rather than an alternative "sacrifice-based matching" concept. Thomas has chosen to define the cost allocation problem in an unsolvable way.

Table 1. Example of the Implicit-rate Approach
(Same Rate of Return during Each Year)

Year	(a) Book Value	(b) Rate of Return	(c) Profit (a)×(b)	(d) Contribution	Depreciation (d)−(c)
1	$13,773	20%	$2,755	$5,000	$2,245
2	11,528	20	2,306	8,000	5,694
3	5,834	20	1,167	7,001	5,834

(Second Stage) Economic contribution versus sacrifice incurrence as the basis for cost allocations.

The "contribution-proportional matching" concept attempts to identify the extent to which each single input has contributed to the production of the output (revenue), i.e., attempts to allocate the output (revenue) to the plural inputs. The purpose of doing this is to use each input's contribution proportion as a basis for the input's cost allocation. But such an attempt to find the "economic contribution" of each input is doomed to failure because of "interactions" among the inputs.

In contrast, we want to proceed on a more promising way in constructing a defendable matching concept. For this purpose, our strategy consists in developing the idea that accounting matching is based upon some perceived "physical (or technical) relationship" between each input and the output and that accounting cost allocation means evaluation of such physical relationships in terms of "the monetary sacrifice incurrence." Such selection of the "sacrifice incurrence" instead of "economic contribution" as a basis for cost allocations enables us to evade the prohibiting effect of the input's "interactions" in cost allocation, because, as Figure 1 clearly indicates, the amount of monetary sacrifice incurred is usually determinable and identifiable with each input in contrast to the intricate interminglings of the inputs'

economic contributions.

(Ex.) To facilitate the readers' understanding of the concept of these "interactions", Thomas cites a case of a farmer manufacturing maple syrup (Thomas, Sept.-Oct. 1975, p. 39). His "inputs" here include land, trees, an ax, labour, auger spouts, pails (for catching the syrup from the sugar maple tree), a bucket (for collecting the contents of the pails) etc. "The output of this process is an inventory of jugs filled with syrup. There's no difficulty in attributing this output to the inputs 'collectively', but any attempt to assign portions of it to individual inputs leads to paradoxes" (Thomas, 1975, p. 39).

My impression about this statement is that one must first of all specify the intended semantic content of the measure(s) which results from an allocation before one can judge whether the allocation is meaningful or not. Even though Thomas stresses the arbitrariness of the current accounting's allocations in the sense of the impossibility of specifying a single best allocaltion scheme, determination of such a single optimal allocation is relative *vis-a-vis* prior specification of the semantic content of the accounting information as a result of the allocations. If the reported accounting income should convey information about the net increase in economic value in excess of the related inputs' values, then the matching concept to be applied must be the "economic-contribution-proportional matching." However, if the meaning of the accounting income measure is regarded as an excess of cash-inflows over the related inputs' (ascribed) monetary sacrifices, then, the sacrifice-proportional matching concept would have to be used in preference to the above economic contribution-proportional concept.

Now, returning to the above "interaction" example about syrup manufacture, let us suppose that one's "purpose" in matching output with inputs lies in discovering what will be the difference between the cash inflow from the sale of the output syrup and the monetary sacrifices incurred for the inputs in producing that particular quantity of syrup. If the pails (and/or buckets) should survive that production, then the amount of sacrifice for that particular quantity of syrup seems equal to the difference between the pail's actual acquisition price and the price at the same date of a pail which shows the same degree of deterioration as the actual one after the manufacture of the syrup. This is so because if this particular productive activity had not been carried out, the above difference would have been dispensed with by purchasing at the acquisition date a used pail of the same degree of deterioration. In this way, even if the "economic contributions" of the plural inputs interact, each input's "monetary sacrifice" in producing the output is relatively clearly identifiable and determinable. Of course, the appropriateness of this sacrifice-proportional allocation depends upon the usefulness of the resulting particular accounting data (especially, the particular income concept) being greater than the alternative data

generated under the other matching and allocation concepts. This latter problem can only be resolved by empirical research because, say, accounting concepts producing different kinds of semantic contents can not be evaluated on pure logical grounds.

Our exposition so far has hopefully clarified the difference between our sacrifice-proportional cost allocations on the basis of physical relationships and Thomas' economic-contribution-proportional cost allocations based on the economic relationships between the output and the inputs. In the next sections, we will develop a new, interpretable depreciation method (plant cost allocation scheme).

III. A Sacrifice-based Depreciation Method

The following proposed depreciation method is based on our standpoint that cost allocation means evaluation of physical relationships in terms of monetary sacrifices, i.e., that the physical service consumed for a year is to be evaluated by reference to the amount of the money which is considered as invested into the year's consumed physical service at the acquisition date of the whole fixed asset (ex., a whole machine).

The arguments that follow will show that an "interest" factor pertains to our consideration. But we will ignore this element, because current conventional accounting does not include the imputed interest on the equity capital in the expenses.

A fixed asset is a bundle of physical or technical services which are planned to be consumed in each of the service years. As time goes and the planned utilization of the service proceeds, the asset grows older. The quality and quantity of service which a brand new asset will provide by the firm's utilization for one year shall be called "one year's new service" and denoted "S_0." The physical service which a just one-year-old asset (i.e., an asset after one year's utilization according to this firm's plan) will provide for one year shall be called "one year's one-year-old service" and denoted "S_1." Similarly, "S_2" shows "one year's two-year-old (asset's) service", and "S_{n-1}" one year's (n–1)-year-old (asset's) service, where n denotes the total service years of the asset.

Using the above denotations, our first assumption is

$$(\text{A fixed asset})=S_1+S_2+\cdots\cdots+S_{n-1}+S_P, \tag{1}$$

where S_P is the service capacity of the scrap state of the asset.

To derive our second important assumption below, we denote the amount of monetary sacrifice which is regarded as paid (incurred) for one year's new service (S_0) as $E(S_0)$. The amount of money which can be regarded as paid for one year's one-year-old service (S_1) shall be expressed as "$E(S_1)$." Similarly, the monetary

sacrifice for one year's two-year-old service (S_2) shall be "$E(S_2)$". $E(S_{n-1})$ is the money invested into one year's (n–1)-year-old service (S_{n-1}). The money considered as paid for the scrap value is $E(S_p)$. Furthermore, A^0 shall denote the (total) expenditure paid for the acquisition of the new asset. Then, a plausible assumption seems to be that

$$A^0=E(S_0)+E(S_1)+E(S_2)+\cdots\cdots+E(S_{n-1})+E(S_p). \tag{2}$$

In other words, our second assumption (2) is that the actual historical acquisition price paid for a new fixed asset consists of the sum total of the monetary sacrifices each of which has been incurred to get each single year's fixed asset's physical service within the service years plus the scrap state of the asset. This assumption seems to be supported by the assumption of the rationality of the buyer's purchase behavior which would prohibit his paying more than the total monetary sacrifices for the consecutive year's asset services (including the scrap value).

Under the sacrifice-based asset cost allocation concept, our task to achieve such an allocation may be said to lie in identifying the amount $E(S_i)$ of each monetary sacrifice for each year's physical service. Naturally, no direct observations of the acquisition price or the physical body of the asset *per se* would give any clue to the identification of $E(S_i)$. Rather, we must make some inference to "indirectly" arrive at each one of the monetary sacrifices.

(1) The identification of $E(S_0)$

Let us denote as A^1 the market price at the new asset's acquisition date (hereafter denoted d_a) of a one-year-old fixed asset of the same kind. We may infer that this price A^1, if it exists, consists of the monetary sacrifice $E(S_1)$ required by the plant market for one year's one-year-old service (S_1), the sacrifice $E(S_2)$ for one year's two-year-old service (S_2) etc., through the sacrifice $E(S_{n-1})$ for one year's (n–1)-year-old service (S_{n-1}) and the sacrifice $E(S_p)$ for the scrap value. That is,

$$A^1=E(S_1)+E(S_2)+\cdots\cdots+E(S_{n-1})+E(S_p). \tag{3}$$

In this equation (3), its right-hand side does not inclue one year's new (asset) service (S_0), because the equations refers to a one-year-used asset.

By comparing equations (2) and (3) above, the monetary sacrifice $E(S_0)$ incurred for the acquisition of one year's new (asset) service S_0 can logically be isolated by subtracting (3) from (2).

$$A^0-A^1=E(S_0). \tag{4}$$

In other words, our inference suggests that the amount of money invested into one year's new physical service (S_0) of the plant asset is equal to the difference between the buying price of the new asset and the buying price of a one-year-old asset of the same kind, both at the acquisition date (d_a) of the firm's actually

purchased new asset.

This conclusion seems acceptable to our intuition and common sense, too, when we note that if the firm did not need to utilize one year's new asset service S_0 this year, but it could stop its operation this year and start to do business using the one year's one-year-old service S_1 next year, using one year's two-year-old service S_2 the year after next and so on, he did not have to purchase a new asset, i.e., that what he had to do in this case was to buy a one-year-old asset at the same point-in-time (d_a) and to keep it waiting for its operation in and after the second year.[3] Accordingly, the price difference between a new and a one-year-old asset at date (d_a) signifies the additional monetary sacrifice which the firm agreed to pay to get and use one year's new service (S_0). Hence, this difference $E(S_0)$ may be said to represent the appropriate depreciation expense for the first service year of the asset.

(2) The identification of $E(S_1)$

Let us denote the purchase price at date d_a of a two-year-old asset of the same kind as this firm's fixed asset as "A^2." Then, following the same reasoning as in (1),

$$A^2=E(S_2)+E(S_3)+.....+E(S_{n-1})+E(S_p). \tag{5}$$

Verbally, the buying price of a two-year-old fixed asset can properly be assumed to be the total of the money sacrifices which would have been incurred for the acquisition of the physical service bundle consisting of one year's two-year-old service through one year's (n–1)-year-old service plus the physical state of the scrapped asset. Then, subtracting (5) from (2), we get

$$A^0-A^2=E(S_0)+E(S_1). \tag{6}$$

Hence, substituting expression (4) of $E(S_0)$ for the $E(S_0)$ on the right-hand side of (6),

$$A^0-A^2=A^0-A^1+E(S_1). \tag{7}$$

Therefore,

$$E(S_1)=A^1-A^2. \tag{8}$$

Formula (8) indicates that the monetary sacrifice incurred for the acquisition of one year's one-year-old service (S_1) can be computed as the difference between the acquisition prices, both at date d_a, of a one-year-old asset and of a two-year-old asset, both of the same kind as this firm's.

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(3) We cannot use the purchase price of a one-year-old asset at the end of the first service year instead of that at the new asset's acquisition date, because the difference between the actual acquisition price of the new asset (at d_a) and the acquisition price of the one-year-old asset one year later contains possible value changes during the first year which is anomalous for the isolation of monetary sacrifices occurred at date d_a and attributable to the 1st year.

An interpretation of this conclusion would be as follows. The difference means the additional amount of money which would have to be paid just for the acquisition of a one year's one-year-old service (S_1) in addition to the bundle of services embodied in a two-year-old asset. In this sense, the difference can be considered as the monetary sacrifice for the one year's one-year-old service (S_1).

But the firm we are considering here is assumed to have purchased at the beginning of the first year a brand new asset and not any used asset. So, some additional justification will seem appropriate. Assume that two firms A and B have bought the same kind of fixed asset, firm A a brand new one and B a one-year-old asset, in the same perfect market at the same time. Then, a plausible assumption seems to be that the monetary sacrifice for the one year's one-year-old service (S_1) which firm A incurred by buying a new asset equals the money for the same quality and quantity of service (S_1) which firm B has paid by purchasing a one-year old asset. (If not, we would have to conclude that the market is irrationally requiring different amounts of money payments for the same service (S_1), depending upon the difference of age of the assets which contain the service). In that sense, one can measure firm A's monetary sacrifice for S_1 by reference to firm B's. Now, if firm B gave up the acquisition of service S_1 and only needed a bundle of services older than S_1, it could have saved some money by first buying not a one-year-old asset but a two-year-old asset. The exact amount saved is clearly equal to the difference between the purchase prices of a one-year-old and a two-years-old asset (which is formula (8)).

(3) The identification of $E(S_3)$

Let "A^3" denote the expenditure required at date d_a for the purchase of a three-year-old fixed asset—the same kind as this firm's. Then,

$$A^3=E(S_3)+E(S_4)+\cdots\cdots+E(S_{n-1})+E(S_p). \tag{9}$$

Subtracting each side of equation (9) from (2), we get

$$\begin{aligned} A^0-A^3&=E(S_0)+E(S_1)+E(S_2)\\ &=(A^0-A^2)+E(S_2). \qquad \text{(From (6)).}\end{aligned}$$

Therefore,

$E(S_2)=A^2-A^3$

=(The acquisition price at this firm's asset purchase date (d_a) of a two-year-old asset) minus (The acquisition price at date d_a of a three-year-old asset). (10)

(4) Proceeding similarly, we can get the following general formula for $E(S_i)$, where $0<i<$n-1,

$$E(S_i)=A^i-A^{i-1}, \tag{11}$$

where S_i denotes one year's i year-old service, A^i and A^{i-1} represent the purchase

prices at d_a of a i-year-old and (i–1)-year-old assets respectively.

(5) The identification of $E(S_{n-1})$ (i.e., the monetary sacrifice for the planned last year's service of the asset).

Let A^{n-2}, A^{n-1} and A^n denote the acquisition prices at d_a of a (n–2), a (n–1) and a n-year-old assets respectively. (For concreteness, a n-year-old asset means the scrap state of the asset for this firm). Then,

$$A^{n-2}=E(S_{n-2})+E(S_{n-1})+E(S_p). \tag{12}$$

$$A^{n-1}=E(S_{n-1})+E(S_p). \tag{13}$$

$$A^n=E(S_p). \tag{14}$$

Formula (14) indicates that the buying price of the scrap state of the fixed asset is assumed to equal $E(S_p)$, the monetary sacrifice which the firm will willingly incur to get the scrap. I imagine this monetary sacrifice is equal to the net proceeds from the disposition of the n-year-used asset at d_a.

Subtracting (14) from (13),

$$\begin{aligned} A^{n-1}-A^n &= E(S_{n-1})+E(S_p)-E(S_p) \\ &= E(S_{n-1}). \end{aligned} \tag{15}$$

Therefore,

(the monetary sacrifice $E(S_{n-1})$ for the planned last year's fixed asset service) =(the acquisition price at d_a of a (n–1)-year-old asset)—(the net proceeds attainable at date d_a from disposition of the n-year-old asset (scrap)).

IV. How to Calculate Sacrifice-based Depreciation Expense in Case of Physical Breakdowns and Obsolescence

Our exposition so far has assumed the realization of the normal use of the fixed asset in strict conformity with the asset's utilization plan. But how should we calculate the "sacrifice-based" depreciation expense, if something "unexpected" should occur in a year?

The unexpected occurrences which are relevant to our depreciation computation could be classified into the following two categories.

(1) The events which directly cause absolute physical deterioration of the fixed asset concerned: fire loss, extraordinary and sudden physical breakdown of the asset etc.

(2) The events which result in a relative physical (and/or) functional deterioration of the asset: obsolescence of the firm's plants by competitors' acquisition of more advanced (i.e., improved) assets or by decreased sales from changes in customer demands.

The former case of "absolute physical deterioration" provides no additional problems. If such unexpected events urges implementation of repairs, the accountant will have to consider the asset after the repairs. What he must do is to evaluate the repaired asset in terms of the "monetary sacrifice" which the firm would have been willing to pay to purchase at the past date of the actual purchase of the asset an asset equivalent in functions to the current repaired asset. For example, assume the damaged asset after repair is expected to have a remaining service life of 5 years. Furthermore, suppose that in retrospect a used fixed asset of the similar kind and of an approximately same remaining output possibility could be bought for \$2,350 at the past date of the actual purchase of the firm's asset. Then, the correct value of the monetary sacrifice for the repaired asset is equal to its past purchase price of \$2,350. Accordingly, the total depreciation expense for this year will be the difference between the beginning-of-year value of the asset's monetary sacrifice and its end-of-year value of \$2,350.

The following interpretation seems possible with respect to the above depreciation calculation for a period when abnormal physical losses have occurred. For the following exposition, assume that at the beginning of this year the fixed asset in the above paragraph had a remaining service life of 7 years. And this asset at the start of this year was given a value of \$3,500 as its proper monetary sacrifice. So,

$$\begin{aligned} A^{t} &= E(S_t)+E(S_{t+1})+E(S_{t+2})+E(S_{t+3})+E(S_{t+4})+E(S_{t+5})+E(S_{t+6}) \\ &= \$3{,}500, \end{aligned} \tag{16}$$

where A^t denotes the acquisition price (at the past date d_a of the purchase of the firm's fixed asset) of an asset with the same output possibility as the firm's at the beginning of this year, $E(S_t)$ the value of monetary sacrifice which is considered as incurred at date d_a for this year's planned asset service S_t, $E(S_{t+1})$ the monetary sacrifice for next year's planned service S_{t+1},.....$E(S_{t+6})$ the monetary sacrifice for the service S_{t+6} planned to be consumed 6 years ahead from this year.

Now, as assumed above, an abnormal breakdown of the asset during this year has decreased the asset's remaining service life to 5 years (last 5 service layers) as of the end of this year. This means that

$$\begin{aligned} A^{t+1} &= E(S_{t+2})+E(S_{t+3})+E(S_{t+4})+E(S_{t+5})+E(S_{t+6}) \\ &= \$2{,}350, \end{aligned} \tag{17}$$

where A^{t+1} shows the acquisition price at date d_a of a used fixed asset with the same output possibility as this firm's asset after the damage (and repairs, if made).

Taking the abnormal damage into account, this year's sacrifice-based depreciation expense is, from (16) and (17),

$$E(S_t)+E(S_{t+1})=A^t-A^{t+1}$$
$$=\$3,500-\$2,350$$
$$=\$1,150. \tag{18}$$

In this sense, the difference between the past acquisition prices of the beginning-of-this-year asset and of the damaged end-of-this-year asset indicates the exact monetary sacrifice which can properly be regarded as incurred for the acquisition of the total services lost this year ($E(S_t)$ and $E(S_{t+1})$) (i.e., this year's total depreciation).

Now, let us proceed to the latter case of "obsolescence." In this context, obsolescence will mean those economic events which by affecting the fixed asset generate one or more of the following consequences: (1) reduction of the remaining useful life of the fixed asset concerned; (2) reduction of the amount of net profit per product unit; (3) simultaneous occurrence of both (1) and (2). In general, the possible causes of these consequences may be said to lie in competitors' acquisition of more advanced plant assets and/or in changes in customer demands. These causes of "obsolescence" seem to be attributable to some "relative physical deterioration" or "physical irrelevance" of the firm's asset to the changed demand. So our problem now is how to evaluate these specific kinds of "relative physical deterioration" or "physical irrelevance" in terms of "monetary sacrifice" which has been incurred for the currently obsolete asset.

We will divide this evaluation problem into the following three cases: (1) The case where the firm set out to purchase some of the obsolete assets in addition to those already owned...(Case A). (2) The case where the firm sells the currently owned, obsolete asset (therefore does not buy any of this kind). (3) The case where the firm neither purchases nor sells any of this kind of obsolete assets.

(Case A)

Three kinds of values of the fixed asset will be considered: its current selling price, its current replacement price and its (subjectively determined) economic value (for this firm). If the firm is assumed to behave in a rational manner, this Case A of the firm additionally buying this obsolete kind of asset suggests that

$$\text{the selling price} < \text{the replacement price} < \text{the economic value.} \tag{19}$$

This is so because a rational manager will set out to buy additional obsolete assets only when he estimates its economic value to him to be larger than its current replacement (i.e., current acquisition) price. (Our assumption in (19) of the replacement price being larger than the selling price could be justified by noting that a dealer in (second-hand) plant assets will, to earn some profit, buy used assets only at a price (=the selling price to a selling firm) below its salable value (=the replacement or current acquisition price for a buying firm).

Under the condition of (19), our problem of evaluating an obsolete asset can

be solved by noting that the maximum "objective" amount of money which the firm would have paid at date d_a, with no regret *ex post facto*, to acquire the bundle of degraded services which are embodied in the existing obsolete asset, is its current "replacement price." (The economic value is assumed to be too subjective to be reported as external accounting information). So, if we define "the appropriate monetary sacrifice" as a maximum amount of money which the firm would have been willing to pay for acquiring a specific service bundle or a service layer at the past date of the actual purchase of the asset, the current replacement price of an obsolete asset of the same kind and age as the firm's one may be said to be the appropriate monetary sacrifice paid for the degraded asset.

Accordingly, in this case A the total depreication for this year is concluded to equal the difference between the past acquisition price (at date d_a) of the beginning-of-this-year asset and the "current" replacement price of the this-year-end asset (after the obsolescence).

(Case B)

In this case, the assumption here of the firm selling the currently owned obsolete asset indicates that

$$\text{the economic value} < \text{the selling price} < \text{the replacement price.} \qquad (20)$$

Formula (20) can be obtained because the firm sets out to sell the existing asset only because its economic value from the future use of the asset is estimated to lie below its current selling price. In this instance, the firm would have paid a monetary amount up to this current selling price if the firm had somehow known the future obsolescence of the asset on past date d_a. This is so since this selling price can safely be recovered by the firm selling this obsolete asset when the firm has found the incurrence of the obsolescence. Consequently, the asset's "selling price" may be said to be its appropriate monetary sacrifice.

Thus, our conclusion in case B is that the total depreciation expense for this year is equal to the difference between the past acquisition price (at date d_a) of the beginning-of-this-year asset and the current (year-end) selling price of the this-year-end asset after obsolescence.

(Case C)

Here is neither buying nor selling out of the obsolete asset by the firm. The assumption of no sale taking place suggests that

$$\text{the asset's current selling price} < \text{its economic value.}$$

And the other assumption of no additional purchase of the same kind of obsolete assets means

$$\text{the asset's economic value} < \text{its current replacement price.}$$

Combining the above two inequalities, we get

the selling price<the economic value<the replacement price. (21)

The firm would be willing to pay any amount up to the economic value of the asset. But we have assumed that the economic value is too subjective and also too arbitrary (because of required predictions and of inevitable interaction of input factors) to obtain the status of accounting information. So, under this restriction, the maximum "objective" price which we can report as the amount the firm would have been willing to pay at date d_a to get the obsolete asset, is its selling price. In this sense, the monetary sacrifice for the year-end obsolete asset seems to be determinable as its current selling price.

Consequently, in this case C we can conclude that the total depreciation expense for this year is to be calculated as the difference between the past acquisition price (at date d_a) of the beginning-of-this-year (used) asset and the year-end selling price of the obsolete asset.

Throughout the cases A, B and C, we could apply the past acquisition price (at d_a) of the this-year-end state of the asset without the obsolescence being taken into account in place of the above recommended current replacement price or the current selling price of the obsolete asset, if these two prices should exceed the former past acquisition price of a used but not obsolete asset. This is so because the "appropriate monetary sacrifice" as a maximum amount of money the firm would have been willing to pay to get this year's consumed plant service layer, must be the "minimum" of the alternative three values being considered. (The firm would not pay more than the minimum monetary amount which is sufficient to get this year's service.)

V. Conclusion

In this paper we have tried to show that under a "matching concept" different from the Thomas' view a study into cost allocation problems is not *a priori* insignificant. And based upon our "monetary sacrifice-proportional matching concept, we have developed a new depreciation method. In essence, this method compares the past acquisition prices at the date of the actual purchase of the asset of the beginning-of-this-year and the end-of-this-year states of the asset and calculates the difference as this year's total depreciation expense. If obsolescence occurs on the plant asset concerned, the end-of-year asset is to be evaluated in terms of its "current" replacement price or of its "current" selling price rather than its past acquisition price.

The advantages of this proposed depreciation method include the following three points.

(1) "Reduced uncertainty in depreciation calculations." In principle, our depreication makes use of "past" acquisition price data alone. So, we are freed from inevitable uncertainty of the conventional depreciation value arising from the use of future uncertain data such as the estimated useful life and the future salvage value of the fixed asset, etc.

(2) "A clear semantic content" of our depreciation value.

The conventional depreciation calculation applies some predetermined computation formula (such as the straight-line, the declining-balance, the sum-of-years'-digits formulas, etc.). Consequently, we do not know what the resulting depreciation value is likely to reflect or report. Probably, the value reflects not so much any substantive aspect of the fixed asset (economic resource) concerned, as the mere fact of the accountant's behavior that the specific depreciation method has been applied and that it has produced the specific depreciation value reported. In short, we can hardly decode any useful semantic content out of the reported conventional depreciation measure.

In contrast, the depreciation value under our proposal clearly and sharply represents a certain aspect of the fixed asset concerned. Suppose that a new plant asset was purchased at \$1,000 by the firm the previous year and a one-year-used asset of the same kind could be bought at \$500 at that time. Then, the 1,000 fund (monetary capital) which was invested into the new asset could have bought a one-year-used asset, with (\$1,000—\$500=) \$500 money remaining at hand. Accordingly, if the firm now possessed a one-year-used asset alone and nothing more, the \$500 capital which could have been saved by acquiring a one-year-used asset at the beginning of the previous year must be considered as "lost and gone." In this sense, the deterioration of the plant asset during the first service year involves the incurrence of monetary loss or "monetary sacrifice" in the amount of \$500, which is the difference between the acquisition prices of the new and the one-year-used assets both at the past date of the firm's actual purchase of the new asset. To sum up, our proposed depreciation represents the amount of "monetary sacrifice" which has been induced during the fiscal year and which must be recovered out of the current revenue to maintain (an equivalent of) the originally invested monetary capital.

Assume furthermore that at the past date of the firm's actual purchase of the new asset the firm could buy a two-year-used asset of the same kind at \$200. Then, a similar reasoning as above shows that in the course of the new asset deteriorating to be a two-year-used one the firm has incurred a capital loss or "monetary sacrifice" of \$800 (=\$1,000—\$200). This monetary sacrifice must be recovered via a charge against revenue to maintain an equivalent of the original capital. And a part (=\$500) of the total monetary sacrifice (\$800) was already charged to the previous year's depreciation expense. So, the amount to be charged to and recovered from this (second)

year's revenue, i.e., the second year's depreciation may be said to be an as yet unrecovered monetary sacrifice of ($800—$500=) $300. This in turn is exactly equal to the difference between the past acquisition prices of a one-year-used asset and of a two-year-used asset.

Thus, we can generalize the above reasoning and conclude that our proposed depreciation calculation clearly reflects the monetary sacrifice (or monetary loss) which has been induced by this year's deterioration of the fixed asset concerned and which must be recovered out of this year's revenue to maintain the monetary capital originally invested into the asset.

(3) "Potential usefulness of our depreciation information."

Let us continue with our example of depreciation in the above section (2). As shown in Table 2, the revenues for the first year and for the second year are assumed to be $600 and $100 respectively. No other expenses are assumed to have been incurred throughout the years. Then, the net income and the accumulated net income for each year are caluculated as in Table 2.

Table 2

Year	Sacrifice-based Depreciation	Revenue	Net Income for each year	Accumulated Net Income
1	500	600	100	100
2	300	100	−200	−100
•	•	•	•	•
•	•	•	•	•
•	•	•	•	•
•	•	•	•	•

(The 1st year)

The net income of $100 signifies that this amount of capital (or fund) increase is attained in comparison with an alternative case where at the beginning of Year 1 a one-year-used asset was purchased and hence $500 cash remained on hand, so no operations were done during Year 1. From this the net income figure of $100 serves the potentially useful purpose of evaluating the relative advantage of this firm's actual business operation for Year 1 in terms of the alternatively possible business policy of acquiring a one-year-used asset to provide for the operations from the 2nd year on, holding $500 cash and doing no operations for the first year.

(The 2nd year)

The accumulated net income (−$100) for Year 2 represents the relative disadvantage (i.e., a capital decrease) over Year 1 and Year 2 of the actually adopted policy of buying a new plant in Year 1 and using (i.e., deteriorating) the asset as actually done, as compared with an alternative strategy of purchasing a two-year-old

asset (at $200) at the beginning of Year 1, holding cash of $800 (out of $1,000 capital) and doing no operations for the two years. In this sense, the accumulated income for Year 2 can serve the potentially useful purpose of evaluating the actually adopted business policy for the sum of Year 1 and 2 in terms of the alternative "no operations" policy for these years (and only for these 2 years).

However, as for the depreciation expense for Year 2, its value $300 can represent the money saved by purchasing a two-year-used one instead of buying a one-year-used one. So, the net loss of $200 for Year 2 will mean a capital decrease by doing business in Year 2 (by acquiring a one-year-used plant) instead of not operating until the third year. However, this whole interpretation is based on the unreal assumption that the firm bought a one-year-used asset at beginning of Year 2. This is contrary to the fact. This firm is assumed to have bought a new asset at the beginning of Year 1. So, we must conclude that the net income for each fiscal year after Year 1 does not have any significant and realistic semantic content with respect to the evaluation of the firm's business activity.

Of course, one could contend that the depreciation values for year 2 and thereafter signify each year's deterioration of the fixed asset as evaluated in terms of the acquisition price difference at a past date. The real problem, however, is what meaning the "evaluation" has when such old prices are to be applied for the valuation.

Lastly, the potential usefulness of the income concept under our sacrifice-based depreciation calculation will be evaluated from the function of business income as an indicator of the maximum distributable fund after maintaining the beginning-of-year capital.

In Table 2 above, the net income of $100 for Year 1 obviously represents the maximum amount of fund available for distribution before one must conclude that the year-end size of capital (a one-year-used asset and some other asset(s)) after the distribution is the same as the content of the capital if the firm has taken the "no-operations" policy after the beginning of Year 1 buying a one-year-old fixed asset and holding $500 cash out of the $1,000 capital invested. That is, if the management of this firm should pay out more than the total annual income of $100 for Year 1, this firm's total capital would certainly decrease or worsen, for in this case the total economic resources would consist of a one-year-used asset and a cash of less than $500 (because of overpayment). In other words, this net income value signifies a very important "critical point" distribution over which would result in the management "regretting" the actually adopted business policy (including the dividend policy) for this Year 1 (i.e., wishing it had done no operations). To express this situation, we may characterize the above income value as a "regret point."

As for Year 2, the accumulated net loss of −$100 for Year 2 indicates that an

addition of $100 (through earning of income) to the capital would have to be made before this firm stopped regretting the actually adopted course of business operations. And the net income of −$200 (or net loss of $200) for Year 2 is the representation that the total distributable amount (in excess of the regret point) of fund over the 1st and 2nd Years has decreased by $200 during Year 2. Since the management's decision on dividend payout is said to partly relate to the firm's utility (or to the legal requirement) with respect to maintaining invested monetary capital or keeping the level of operations at a minimum, our income information as an indicator of the "regret point" being exceeded or not should be a concern to the management in forming its income distribution policy.

REFERENCES

[1] Rosenfield, Paul, "The Confusion between General Price-level Restatement and Current Value Accounting," *The Journal of Accountancy*, October 1972.

[2] ———, "GPP Accounting—Relevance and Interpretability," *The Journal of Accountancy*, August 1975.

[3] Thomas, Arthur L., *The Allocation Problem: Part Two*, American Accounting Association, 1974.

[4] ———, "The Allocation Fallacy and Financial Analysis," *Financial Analysts Journal*, September-October 1975.

A NEW TYPE OF DATA BANKING SYSTEM

—BEICA System—

Hiroshi SADAMICHI

I. Introduction

Computer science has been making such rapid progress since the appearance of the first program-stored computer EDSAC in 1949 that every ten years we have seen a new generation of electronical data processing from the viewpoint of software computer technology. The first generation covered the period of the fifties during which there was no operating system that could process jobs continuously one after another without first having operators' intervention.

The sixties marked the second generation which was characterized by the operating systems, uniprogrammed or multiprogrammed, and the wide-spread introduction of what is now known as 'the online real-time system.' Since this period we have seen a remarkable advance in computer technology such as integrated circuits, high speed discs, etc. An efficient way of slicing the relatively very expensive CPU time came into practical use which allocated the time among many jobs most efficiently. A great number of terminals in the form of either typewriters or videodisplay units were connected with a central computer in the remote place, so that many small jobs from different terminals could be read in and processed by the central computer simultaneously.

The third generation in which we live now refers to the period of the seventies, which has witnessed another big step forward in both hardware and software technology. The invention of MOS or IC memory storage and the increasing usage of MSI and LSI have made it possible to develop highly sophisticated software to the extent that there could be practically no limit on the size of main memory storage, hence that of individual computer programs. Along with the real-time usuage the time-sharing system came into wide use. Many kinds of data base systems have made their appearance since the early seventies. One of the most widely used in the United States is the DRI data base and its time-sharing system. This system has hundreds of typewriter terminals located all over the country which are connected with one huge computer in Massachusetts. The bigger the central computer grows, the quicker response can the terminals receive and the more you will have to pay. There arises a most important problem to be solved.

Suppose you wish to make a simple statistical analysis of, for example, the gross national product through one of the terminals. It will cost you about $1.00 to retrieve

and print out one GNP series of quarterly data from 1948 : 1 to 1954 : 4 and at least $10.00 just to run a single, simple regression of the current with the one period lagged GNP. So some new type of time-sharing system should be in order which can bring about a more economical and practical usuage of the central bigger computer. Before going further, we will take a brief look at the development of the philosophy lying behind the efficient usuage of the computers.

II. The Philosophy of the Efficient Usuage

Computers in the fifties were operated under the uniprogrammed operating system so that each job could not be run until the prior job in process was done. What mattered here was to minimize the amount of idle time spent between jobs. The main drawback of the computers in this period was that it was very uneconomical to run such a job as required a small amount of processing time (CPU time) and a large amount of data reading and printing time (I/O time) since a greater part of total computer time would be spent leaving the main memory storage unused which was far costlier than the input-output units.

Most of computers which appeared after the early sixties have been operated under the multiprogrammed operating system, which is capable of executing two or more jobs simultaneously by allocating core memory storage and assigning a small amount of CPU time to the jobs, one by one, while taking it away from another that either needs I/O time or runs overtime. The idea is to minimize the amount of idle CPU time spent by making full use of such a nature of the computer that the I/O units can operate in parallel with the central processor. All application systems that run today on real-time or time-sharing systems are operated under essentially the same logic as described above.

The common feature of both the real-time and the time-sharing systems is that terminals are just terminal typewriters or videodisplay units which function as a sender or receiver of messages, not as a small computer which can run jobs. The more terminals there are, the bigger computers are needed. But, the bigger computer, the more expensive CPU time. As mentioned earlier, it will cost at least $10.00 to run only one simple regression and about $1.00 to print out one series of quarterly data. So the amount of the CPU time of the central computer used in this regression analysis will cost at least $9.00. This means that there might not be a big problem for a real-time system which consumes only a little of the CPU time of the central computer. However there arises a serious problem for time-sharing systems which generally use a far larger amount of the CPU time of the central computer.

A different type of time-sharing system is therefore in order. The new system will be a mixed type of the time-sharing and the real-time systems with small-size or

medium-size computers as its terminals. This will allow the central computer to function more like real-time system engaged mainly in data management while the terminal computers do most of processing. In other words the new system will let the terminal computers take the place of the CPU of the central computer most of the time. To expedite processing on the part of terminal computers the central computer will supply not only data in the usual sense but also various kinds of programs as data in the wider sense. The central computer will concentrate on data management and execute only those jobs which can not be handled by the terminal computers. In this way we come up to a new stage where the optimal (economical and efficient) utilization can be realized of the CPU's and I/O units of the central and the terminal computers. To this approach we may refer as a new type of data banking system since the central computer acts mainly as a data bank depositing or with drawing pieces of data from the data base in response to requests from the terminal computers.

III. Comparison Between Different Types of Computer Usuage

We shall discuss here how differently the computers are used nowadays from the viewpoint of data management. The programming systems may be classified into 4 different types—the batch, the real-time, the time-sharing, and the data base systems—on the basis of the way they manage their subprograms and data files.

The batch system is most widely adopted in the third generation of the computer age. The batch system refers to the way of processing on the part of the operating system those jobs of which each aims to make analysis of a single set of data for a single purpose. It is characterized by the fixed ordering of analytical processes and the preassigned arrangement of data determined by the analytical program. Each program is fed into the central computer together with all data to be analysed. In other words each job stands alone on itself. Typical examples are payroll systems, cost accounting systems, scheduling, etc.

Chart 1. Batch Systems

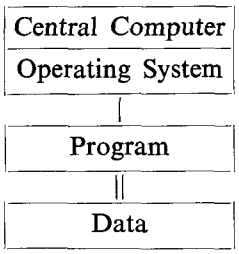
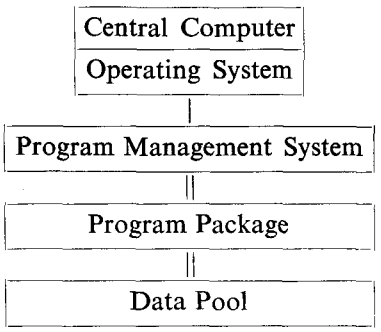


Chart 2. Real-time Systems



The real-time and the time-sharing systems are both featured by the highlevel management of subprograms so that they are capable of complicated analyses for many

purposes. The real-time system is more suited to the type of jobs to work on one huge set of homogeneous data for many purposes. The program management system enables you to make a free combination of analytical processes in any order in sharp contrast to the batch system. However the structure of data files are determined uniquely by the analytical programs in the system as is the case with the batch system. The real-time systems are typically installed in such a field as banks, airlines, etc.

The time-sharing system concentrates on many sets of heterogeneous data with higher complexity of analyses. Analyses in the time-sharing system is therefore far more time-consuming than in the real-time system. It may be said that the real-time system is more data-oriented while the time-sharing system is more program- or analysis-oriented. So the time-sharing system is richer in a variety of analyses and incorporates several program packages each of which has its own set of data under control. As in the real-time system each set of data in the time-sharing system is solely dependent on its particular program package so that any program package may not have access to any other set of data than its own. APL, MARK III, and ASTRO-FOIL present some good examples.

Chart 3. Time-sharing System

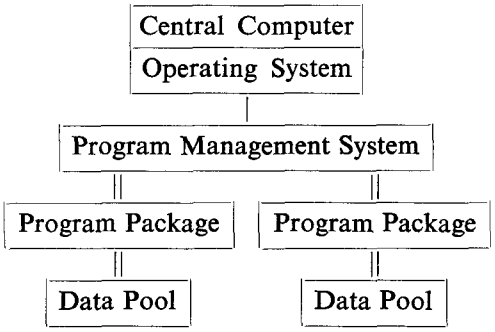
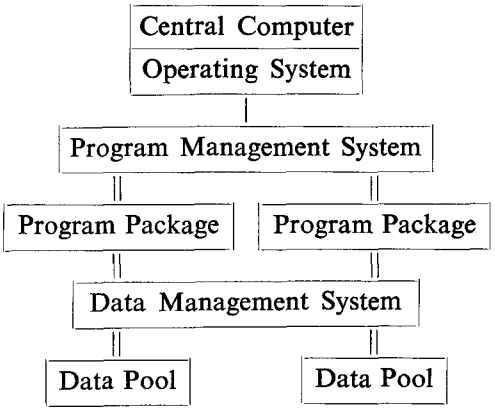


Chart 4. Data Base Systems



The data base system may be said to be a more sophisticated version of time-sharing system. Its development got started in the early seventies and has now come near completion. This system embodies not only the program management system but also the data management system which interfaces between the program packages and the sets of data. The file structure of each set of data is far more independently determined of the program packages and so much more flexibility and efficiency can be attained in data management of the new system. The introduction of the data management system features the data base system as you can tell from its name. In

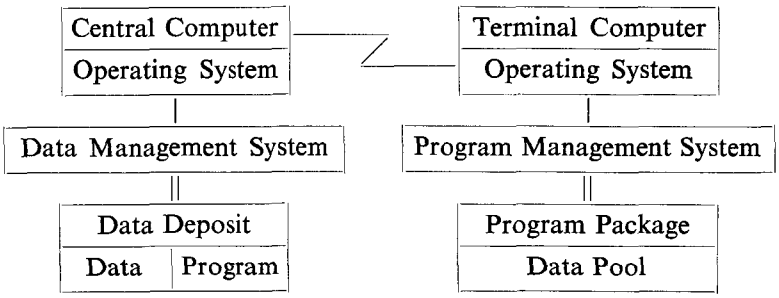
so far as the data management system is part of the entire system it must be subject to the way programs in the program packages handle data. So most of the data base systems so far developed do not implement those complicated statistical programs which may bear heavy burden on the data management system and center more around the filing or retrieving of collective data. DRI system, IBM's GIS and IMS, GE's IDS may be classified under this category of data base systems. It should be noted that the data management system incorporated in the data base system is something new that has not been treated in so systematic a way. We are now on our way to the new era when more emphasis will be put on a more sophisticated, efficient and economical way of managing data.

IV. A Data Banking System

Now we live toward the end of the third generation of the computer age. Yet some important problems on how to manage information in an optimal way still remain to be solved. The data base systems have made a great deal of improvement in data management with little attention paid to economic efficiency. As pointed earlier you have to pay at least $10.00 for just running a simple regression using data in the data base through a terminal typewriter. You may retrieve time series data but may not cross section data from the data base simply because of the poor nature of the data management system. Here we can see two main problems in the present data base systems or time-sharing systems in general. The first problem is to develop a more sophisticated type of data management system and the second one is how to cut down the cost of using the central computers. These two problems are conflicting each other. Generally speaking, the bigger computer you have, the more efficient and sophisticated data management system you can work out. But the bigger machine, the costlier to use. Since we can not do anything about the first problem except for making use of bigger computers, we will have to find any better solution to the second problem. Careful examination may reveal the fact that the trouble with the present time-sharing system lies in its terminal typewriters doing nothing but sending or receiving messages from the central computer which actually does everything. Why not let the expensive big computer do only the job of data management and the inexpensive small machine take care of the rest of the job? The idea behind it is how to make the optimal allocation of processing time between the costly central computer and the cheap terminal machines. This new philisophy of economic efficiency is different from the old one in that what matters in the former is two different kinds of CPU time, not the CPU time and I/O time which concerns the latter. The terminals here are no longer just terminals but smaller computers which are capable of processing the information received from the central computer. In

this new system as shown in Chart 5, the central computer holds a huge deposit of data in a wider sense that covers programs as well as data, and functions mainly as a manager of the department of this data storage, while the terminal computers play the role of managers in charge of the departments of data processing. The central computer provides the terminal machines not only with data but also with those programs which analyse the data on the site of the terminal machines. The central computer may be called 'the data bank' because it is a bank doing such information services as depositing and offering programs and data in response to the requests from terminal computers. To this new system as a whole we shall refer as the data banking system.

Chart 5. Data Banking System



Each terminal computer has its own program management system as the master scheduler which controls its exchange of information with the central computer and supervises all jobs to be processed on its side. It may have its own program package and data pool equipped on the terminal side, which generally contain those programs and data either used very frequently or unnecessary to be stored in the central bank. It may also transfer some jobs which it can not process efficiently to the central computer for their execution.

In the data banking system the high speed CPU and huge memory storage of the central computer will be fully utilized to attain the highest efficiency in data management such as retrieval, sorting, updating, etc., so that each terminal computer may be relieved of its fatal burden on data management and increase efficiency in the utilization of its CPU. Thus, the data banking system will have solved the two problems we posed concerning the defects of the current time-sharing system, that is, the lesser use of the expensive CPU of the central computer and the greater and more efficient utilization of the cheap CPU of the terminal computer.

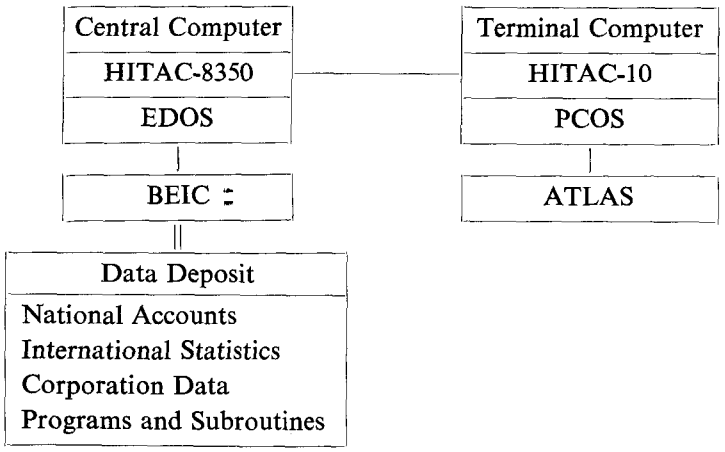
V. A Pilot Model of the Data Banking System

BEICA system (Business & Economic Information Control and Analysis System)

presents a pilot model of the data banking system just described above. This system has been developing under the 3-year project starting in 1974 at the Research Institute of Kobe University. It uses as its central computer HITAC-8350 which has main memory storage of 256 KB with 4 disc drives of 120 MB and as its terminal machine HITAC-10 which has core memory of 64 KB with no auxiliary storages. The terminal computer is connected with the central one in the in-line, not telecommunicative, method.

BEICA system is a data banking system designed principally for simulation analyses of strategic management and economic planning. Included in the data deposit of the central machine are the time series data of over 3,000 items from the national accounts, the international financial statistics of about 200 countries from the International Monetary Fund, the financial and income statements data of over 800 large manufacturing corporations and a package of over 100 programs and subroutines for the terminal computer.

Chart 6. BEICA System



BEIC (Business & Economic Information Controller) is the data management system in the central computer. Among the programs in the data deposit there are two important application programs—STEPS (Statistical Techniques for Economic Planning and Simulation) and STAFFS (Statistical Techniques for Appraising Firms' Financial Statements).

ATLAS (All-round Techniques for Linking Applications and Subroutines) is the program management system of the terminal computer. It is also stored in the program file of the data deposit and is called into the terminal computer by the operating system PCOS. Once ATLAS gets started it supervises all the jobs to be processed on the terminal side.

ATLAS is a conversational type of system so that you may communicate with the machine in ATLAS language. When an ATLAS statement is typed in, the language processor of ATLAS interprets it and requests your retyping if any grammatical errors are found. If there is no error in the statement, the caller sends messages to the central computer to call for the necessary programs in the data deposit. The loader then executes the statement after loading the programs received from the data deposit. The statement may exchange data with the central computer during its execution if necessary. If the statement has been executed successfully the

Chart 7. Sample Program

```
JOB              'MANAGEMENT ANALYSIS OF CHEMICAL FIRMS'
NOTE             DEFINITION OF SETS
CROSS            CHEM='4001'—'4999'
TIME             TX=1960—1970; T=1970
ANAL (CHEM)      CROSS
RUN              T
DRAW             CAPITAL='2600'
SET              BIGCHEM=TRUE|CAPITAL>10
NOTE***          TIME SERIES ANALYSIS ***
ANAL (TX)        TIME
RUN              BIGCHEM
DRAW             SAL='3100', CAPIT='2600', ASS='2000'
PRINT            NEWPAGE, COL(10), 'FIRM CODE=', CROSS@
REGRESS          SAL/CAPIT WITH ASS
END              RUN
NOTE***          CROSS SECTION ANALYSIS***
ANAL (BIGCHEM)   CROSS
RUN              T
DRAW             DIVIDEND='4730', PROFIT='4790', GPROFIT='3500'
  +              SALE='3100', WORKER='2940', CURRASS='1100'
  +              CURRDEBT='2100', ASSET='2000'
LET              X#1=DIVIDEND/PROFIT; X#2=SALE/CAPITAL;
  +              X#3=PROFIT/ASSET; X#4=GPROFIT/SALE;
  +              X#5=CURRDEBT/CURRASS; X#6=SALE/WORKER
SET              HICHEM=TRUE/X#1>0.6; LOCHEM=TRUE X#1<0.6
PRINT            NEWPAGE, 'GROUP 1: FIRMS WITH HIGH DIVIDEND
                 RATIO'
PRINT (HICHEM)   CROSS@, COL(10), X#1—X#6
PRINT            NEWPAGE, 'GROUP 2: FIRMS WITH LOW DIVIDEND
                 RATIO'
PRINT (LOCHEM)   CROSS@, COL(10), X#1%—X#6%
LET              CLASS=1; CLASS=2|X#1<0.6
DISCRIM          X#2—X#6 BY CLASS
STOP
```

ATLAS monitor gets control back again and asks you to type in the next statement. If not, the program in execution will ask you what to do with errors encountered.

We shall show in chart 7 one sample program written in ATLAS language. This is a program actually written for the application program called STAFFS, which ATLAS reads into the terminal computer from the data deposit of the central computer. What this program does is (1) to make a time series analysis of regressing capital turnover on assets for each chemical firm, and (2) to carry a cross section analysis to find a discriminant function of two groups of chemical firms with higher divident ratio and those with lower ratio. Each ATLAS statement consists of the subject part and the description part. The subject part refers to the type of analysis and the description part gives the information necessary for analysis.

It should be noted here that there are three classes of statements in the sample program. The first class refers to those statements which are ready to be executed. The second class consists of those statements which are executed only after the appropriate programs are called in from the central computer. Most of statistical programs such as REGRESS and DISCRIM belong to this second class. The third class includes those statements which are executed by the central computer. All the statements associated with the data in the data deposit fall under this class. CROSS, TIME and DRAW are these examples. The very existence of these three classes of statements features the role of the terminal computer in the data banking system.

REFERENCES

[1] Data Resources Inc., *Reference Manuals of AID, EPL, XEPL, MODSIM,* Data Resources, Inc., Massachusetts, 1975.

[2] Dixson, W. J., ed., *BMD Biomedical Computer Programs,* University of California Press, Berkeley, 1973.

[3] Rustin, R., ed., Data Base Systems, Prentice-Hall, Inc., New Jersey, 1972.

[4] Sadamichi, H., "Statistical Techniques for Appraising Firms' Financial Statements," *Annual Report on Economics and Business Administration,* Vol. 26, No. 2, Research Institute for Economic & Business Administration, Kobe University, 1976.

[5] Sugiura, I., ASTRO-FOIL *Program System for Economic Planning and Forcast,* Nippon Hyōronsha, 1973.

EXPECTATIONS IN THE SHIPPING EXCHANGE

Tetsuji SHIMOJO

1. Preface

Many attempts have been made,[1] to build models to explain the determining and varying processes of the ocean freight levels, and to forecast their future under various given conditions. Not for mere theoretical inquiries, but for the practical forecast of the actual markets, a huge and complex model only can serve. And moreover, very large difficulties can be expected in collecting data, in realizing models, and in making estimates useful for their business.

Generally speaking, theoretical studies may be undertaken under the assumption that all informations needed for the model are available in time, while practical thinking must cease if some information is unavailable. This is true also in the shipping market forecasting, some problems are left unsolved in the assumption that the quantity of shipping services supplied and demanded are measurable and available for any period we need. Very often we cannot get seaborne trade statistics even for the period as close as the previous year, and worse, we depend entirely upon the statistics composers for precision, classification of the data, and so forth.

The more precise a forecast we want, the more recent information we need. It would be very useful if we had a method through which we could get the information needed for market forecasting from the materials available rather easily. In this respect, our attention should be called to the fact that every fixture made in the Baltic Exchange is immediately reported everyday. Freight rates and charter hire rates in these fixtures must contain many informations for our purpose, as they are fixed by the experts who are engaged to pay all their attention to reflect all information they have at the moment. What we must do is to extract this information from the fixtures.

"Market tells about market" is an old saying.[2] We will begin with the common sense assumption that, in other words, the connection between voyage charter rates and time charter rates tells us about the future levels of the market. Arthur Lewis [1] and Yoshinobu Maeda [2] examined this proposition in their empirical studies, and W. G. Weston [3] tried to make it pracrically applicable. In this paper, we will

(1) For the review of these attempts, see T. Shimojo [8].

(2) A Japanese saying well known in the stock markets is meaning more precisely 'Ask the market about the market.' I don't know if there is such a saying in western countries.

trace its cause rather theoretically and propose a method to extract the information and to use it for the forecast.[3]

2. Concept of Expectation Curve Method

Evaluating the current market levels, and prospecting their trend in the future, one can assume the market level at any time points in the future. Or he can draw his own "expectation curve" by plotting the expected values for several time points. The expectation curve is a line drawn from a point on the vertical axis to the right hand in a graph, of which the vertical axis represents the market level and the horizontal axis represents the time from the present to the future. This curve apparently is a continuous line, but we cannot assume whether it be a straight line or not.

We can suppose that the men in the Shipping Exchange, or in the Stock Markets always have their own expectation curve in their minds. These curves are changing their forms from time to time according to the informations they come to know. Or we may say that they always prepare such curves in their minds to make their best prospect at any time. The prospect is an important element of the 'idea' they propose for a certain transaction. But it will be demonstrated later that the prospect is not always the same as the idea they quote.

All chartering contracts are more or less future contracts, which will be performed in the future. After fixing a contract, one does nothing but adhere to it even if current prices are far from promise. One can only regret one's wrong prospect. This is the reason why one used one's best ability to find the best prospect.

In long-term contracts, one is constantly restricted by the terms and conditions during the continuance of the contract. As the market may change during the duration, the differences between the levels prospected at the time of contract and the current actual levels will become at times larger or smaller. If an average level of the actual market during the duration of the contract is similar to the fixed level, then the prospect can be said to have been appropriate. Contracts are made coincidentally with interests concerned. When a contract is fixed, it means that the level of prospect was found as a meeting point between the two parties. The point may be deemed as least regret rather than largest satisfaction for them.

It can be said from the above explanation that, when a certain transaction is offered, the prospect born in mind depends upon the time of commencement and the duration of the contract. We have already assumed that each of the parties has its own expectation curve. Their prospects, therefore, are to be shown as a part of the curve. Fig. 1, in which the expectation curve is drawn as a straight line, tells a

(3) This paper is a joint abstract from my own papers, for which I owe very much to late Prof. Dr. Sempei Sawa [5] and [6] above all.

case where the prospect in the market decreases as the time moves away from the present. A level MN will be appropriate for the contract commenced at the time B and performed during the duration B to D. As the point N is the central point of BD, MN represents the average of the levels prospected for any time between B and D.

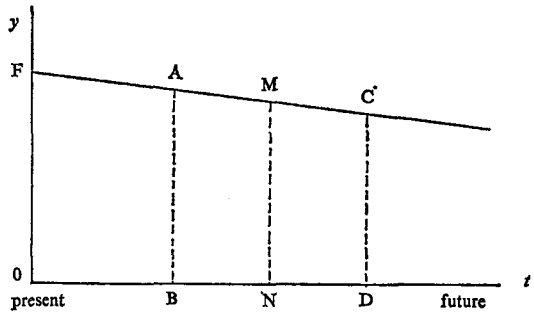


Fig. 1. Expectation Curve

Suppose a man in the market has an expectation curve in his mind like as in Fig. 1, he evaluates the present level as FO and prospects the levels as AB at the time B and CD at the time D. In other words, his expectation curve is expressed in the equation

$$y=b+mx,$$

where his levels of prospect y is separated into two parts, the current actual level b and the difference mx which is extending in proportion to the time x by a parameter m. In Fig. 1, the parameter m is, needless to say, less than zero. In short, the prospect borne by the man in the market will be represented by b and m, which corresponds to the level he prospects for the moment and the trend of the market in the future respectively.

In the ship chartering market, as they aim at a certain time point in the future at the bargaining for the contract, it will be easier to deal with the expectation than in the stock market. An offered transaction has a time to commence and a duration. We can summarize these two factors into a new concept of "prepositive time" which is construed as the time giving an average level of prospect from an expectation curve. If the expectation curve is a straight line,

$$\text{prepositive time} = \text{lead time of the contract} + \frac{1}{2}\,\text{duration of the contract.}$$

The lead time is the time difference between the time of contract and the time of commencement of the contract.

Given a prepositive time of the contract, a man in the market will get a prospect appropriate for the contract by means of his expectation curve at the moment. But his prospect will not be quoted as his idea for the contract without any modification. He may modify this level in order to stand himself on more profitable grounds in the following bargaining process. The ideas quoted by the two parties will converge in the course of the bargaining process to a common level, otherwise, the bargaining will cease without success. During the bargaining process, both parties insist on their quotation being more appropriate, and the ideas will converge to a common level, closer to either level according to the atmosphere of the market and the favourableness of either party at the moment.

When the contract is fixed, we may say that the expectation curves of the two persons have met at a point, at least, as far as the prepositive time is concerned. Their expectation curves may have moved in the course of bargaining by new informations on the market. In any way, the point they have reached in the end must be a point in the ex-post expectation curves of the two parties. Collecting such points from many fixtures in a certain period, we can reproduce an aggregated ex-post expectation curve for that period. And we feel this curve will tell us well about what we were looking for. This is what we call the Expectation Curve Method.

3. Estimation of Expectation Curves

Let us try to deal with the data extracted from the actual market. It is desirable for our purpose to choose such a period where we can find many fixtures for one trade route. Otherwise we face to many difficulties in converting the various freight rates into a standard one considering the differences of cargoes and routes, and it seems that the improper conversion of the data might lead us to misunderstanding on the interrelation between the rates and the prepositive times. For such a consideration, we chose the coal trade from Hampton Roads to U. K. or Continent for the years 1955 to 1957, for which we can use the weekly reports [4] of the Maritime Research Inc.

We firstly picked up the lead times and the numbers of voyages from the fixtures for the said trade, and assembled them into monthly tables which we call the L-V Tables, and of which a sample is shown in Tab. 1. Tab. 1 contains the average rates (upper) and the number of fixtures (lower) classified by the lead time (L) and the number of voyages (V). We can say the following about these 36 tables;

(1) There are comparatively many fixtures of the near future and of short terms;
(2) There are very few fixtures of the far future and of short terms for the difficulties to distribute the risks;
(3) There are a few fixtures of the near future and of long terms no matter how

the rates may be;

(4) The foreward fixtures are almost all long terms.

We secondly calculated the prepositive times from the L-V Tables. As already defined, the prepositive time is calculated as the sum of the lead time and a half of the duration. And duration is a product of the number of voyages and the time (in months) taken for a voyage. The standard ships of those days used to take about 40 days for a round voyage from Hampton Roads to Europe. Thus we could get new tables named the FBPT Tables (Fixtures By Prepositive Time Tables), of which a sample is shown in Tab. 2.

As a final step, we estimated the parameters b and m in the equation

$$y=b+mx$$

for each month by means of the least square method, denoting the rates by y and the prepositive time by x. We adopted in the above course the assumption that the curve may be expressed by a linear equation, for the scattered graphs we obtained from the above FBPT Tables seemed to be approximately a straight line. A sample of the graphs is shown in Fig. 2.

Table 1. A Sample of L-V Tables (Jan. 1956)

V \ L	1	2	3	4	5	6	7	8	10	12
1	986 42	981 6	966 1							
2	972 3	952 1								
3	980 11	938 2								
4	959 1	910 1	910 1							
6										
9		860 5								
12		735 1								
18	763 3		777 1				763 1			
27						710 1				675 2
36						672 1				654 2

L: Lead Time, V: Number of Voyages

Table 2. A Sample of FBPT Tables (Jan. 1956)

P.T.	No. of Fix.	Avr. Rate	Avr. P.T.
1	42	986	1.0
2	9	978	1.9
3	14	976	2.5
4	3	929	3.6
5	1	910	5.0
6	–	–	–
9	6	839	7.4
12	–	–	–
18	4	767	12.8
24	2	734	20.8
30	3	674	29.3
36	2	654	35.3
Avr.	86	924	4.7

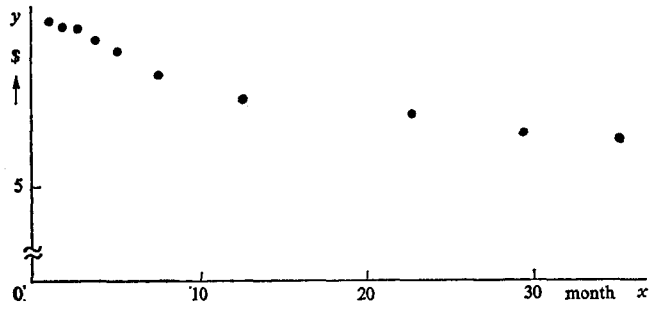


Fig. 2. A Scattered Graph (Jan. 1956)

Through the above estimation, we obtained the results shown in Tab. 3, in which Yr., Mo., No., P.T., A.R., and R represent respectively Year, Month, Number of fixtures, Prepositive Time, Average Rates, and Correlation Coefficients. In this table we can see that the coal fixtures in January 1956 numbered 86 with an average rate \$9.36, and that the relation between the rates and the prepositive times was represented by the equation

$$y=990-11.477x$$

for which the correlation coefficient was 0.9542. In other words, the fixtures of this month were apt to decrease in proportion to the length of the prepositive time, and the decreasing ratio was about 11.5 cents a month of the prepositive time. And if it were possible to find a contract that commences instantly and finishes immediately, the rate appropriate for such a contract would be \$9.90.

Table 3. Results of Estimation

Yr.	Mo.	No.	P.T.	A.R.	m	b	R
55	1	14	3.3	733	−14.850	781	−0.9851
55	2	23	4.3	744	−23.794	846	−0.9761
55	3	53	4.6	659	−6.897	691	−0.9236
55	4	46	5.2	677	−5.701	706	−0.8911
55	5	34	2.9	770	−10.709	802	−0.8141
55	6	95	3.5	823	−12.577	867	−0.9665
55	7	83	3.5	828	−8.530	858	−0.9361
55	8	52	5.4	791	−8.406	837	−0.9612
55	9	68	4.3	905	−12.439	959	−0.9249
55	10	73	5.1	937	−10.982	994	−0.9780
55	11	52	4.5	882	−10.549	930	−0.9694
55	12	49	2.2	933	−14.080	964	−0.9624
56	1	86	4.7	936	−11.477	990	−0.9542
56	2	38	4.5	918	−10.674	966	−0.9323
56	3	82	8.4	928	−10.236	1014	−0.9770
56	4	37	8.1	979	−11.870	1075	−0.9904
56	5	115	7.6	1043	−9.238	1114	−0.9585
56	6	52	5.8	983	−9.986	1041	−0.9679
56	7	43	4.8	964	−5.611	990	−0.9940
56	8	52	3.1	973	−5.309	990	−0.9791
56	9	59	9.6	960	−4.743	1006	−0.9953
56	10	63	5.1	1018	−6.440	1051	−0.9750
56	11	70	2.1	1270	−15.945	1304	−0.7724
56	12	85	3.0	1482	−22.092	1548	−0.8338
57	1	111	7.7	1357	−9.365	1429	−0.9144
57	2	121	6.9	1228	−10.110	1297	−0.8507
57	3	84	3.7	962	−4.620	980	−0.8706
57	4	56	3.1	922	−5.030	938	−0.6399
57	5	72	2.6	725	11.230	696	0.4978
57	6	35	5.2	669	0.808	665	0.5444
57	7	38	2.6	595	26.951	526	0.9244
57	8	34	5.6	461	5.683	430	0.9421
57	9	33	5.3	433	6.470	399	0.9446
57	10	55	2.6	462	3.679	453	0.8774
57	11	38	4.0	446	1.646	440	0.7268
57	12	23	1.9	398	16.174	368	0.9450

Now we have five factors for each month, i.e., Number of Fixtures, Average Prepositive Times, Average Freight Rates, Expectation Coefficients, and Real Time Rates, of which the last two concepts need no more explanation as they have often appeared in the above discussion under the symbols m and b. We will give similar symbols to the rest, n, x and y, respectively. What we must do next is to let the five factors tell about the future.

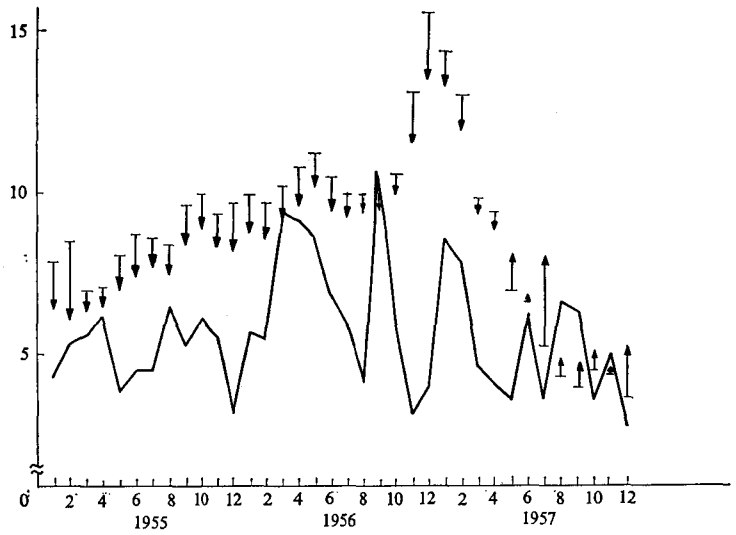


Fig. 3. Changes of the 3 factors *n*, *b* **and** *m*. *n* is represented by kinked line, while *m* is expressed by length of arrows and *b* is located at root of arrows.

From the fixtures reported daily at the shipping exchanges in the world, we can easily estimate these five factors every month or even every week. But a difficulty will arise if there are not sufficient fixtures, when we cannot estimate the expectation coefficients and the real time rates unless we adopt more trade routes with some necessary conversion. For example, there would be a method to estimate the parameters with the index numbers placing a spot-rate as the basis for the respective trade route.

4. Use of the Five Factors

To consider the uses of these five numbers, we must examine their nature, the significance of their changes, and their relationship to the future of the markets. We can see in the markets the favourableness[4] for either party according to the situation of each moment. We wish we could explain the concept with numbers.

The prepositive time represents the time of performance of the contract. The average prepositive time represents, therefore, the degree to which the total fixtures of the month lean to shorter or longer ones. On the other hand, the expectation coefficients signify the degree to which the men in the markets as a whole prospect the future as inclining or declining. Moreover, it will be noted in observing these

(4) By 'favourableness' I mean "shite" relation in Japanese. "Shite means a leading actor in the Noh play.

factors that the favourableness of the market is playing an important part in the bargaining processes.

Shipowners and charterers originally stand on opposite grounds, so that they behave reversely as long as they have the same prospect. And it is natural that they have almost always similar prospects, as they see and hear the same informations through the same sources. It is no curious matter, especially in such a market that a shipbroker and a chartering agent often change their positions towards each other. It seems impossible that a man changes his prospect according to his stand as a shipbroker or a chartering agent.

If they have the same prospect, they behave reversely. This is the reason why there remains room to bargain and to compromise. In this process, which of them stands on more favourable ground, which bargains in a more favourable way, and which obtains more favourable rates, all depends upon the situation of ships and cargoes at that moment.

Tone of the market is the entirety of the rates which is embodied from the confidence of both parties to their own prospect. It may be thought, therefore, that the fixtures in a certain time are affected more by either assertion. We can see it in the changes of our five factors.

There appears the tendency to shorter fixtures in case (a) where the shipbrokers center on the offers of shorter periods, prospecting the future will show an upward trend, or in case (b) where the chartering agents offer shorter contracts in view of a downward trend in the future, another case (c) where there are many ships or cargoes ready for immediate requirements. The former two cases (a) and (b) cannot take place in a moment. And needless to say, the cases of the tendency to longer fixtures can be explained in the reverse way.

What we have to note in the above discussion are the following matters; If there are many shorter fixtures under the case (a), the initiative of the market is on the shipowners' side, so that the situation is favourable for the shipowners; If the same consequences take place under the case (b), then the charterers have the initiative, and the situation is favourable for them.

We can now conclude our discussion as follows:

When the market is prospected upward,

Shipowners prefer shorter contracts, and

Charterers prefer longer contracts.

When the market is prospected downward,

Shipowners prefer longer contracts, and

Charterers prefer shorter contracts.

We can say in other words using our factors:

When the expectation coefficient m is high and the average prepositive time x is

short, or when m is low and x is long, then the favourableness of the market is on the shipowners' side.
When m is high and x is long, or when m is low and x is short, then the favourableness of the market is on the charterers' side.

In the bargaining process, shipowners and charterers may have their own ideas, differing far from each other, due to their wishful thinking or as a strategic design. Though they have similar prospects, their confidence and impudence may differ, or either of them may have to reserve more room to compromise owing to the urgency of his ships or cargoes. Estimating our factors from fixtures of the month and observing the favourableness, we can expect that the factors enable us to forecast the future of the markets.

5. Long-term Rate Curves

Now we are at the stage to consider the theory of Z. A. Zannetos [5], who inquired into the long-term charter rates of the oil tankships. The differences are not vital between oil tankships and general cargo ships, especially tramp ships, of which we have been mainly conscious. But the duration of charter contracts in the former trades are conspicuously longer.

Z. A. Zannetos points out the following ten factors as the most important determinants of the long-term rates.

1. The short-term rates as of a moment of time.
2. The expectations about the future that short rates create.
3. The status of tie-ups at a particular point of time.
4. The level of orders outstanding.
5. The size of a particular vessel.
6. The type of the propulsion system of the vessel.
7. The duration of the charter agreement.
8. The lead time.
9. The type of cargo carried by the vessel.
10. The type of currency in which payment is made.

These factors will be classified by ourselves into three more generous groups, (A) the current rate level, (B) the factors that affect rates in the future, and (C) the particular characteristics of the agreement.

"The short-term rate is expected to influence the long-term rate both on the upswing and during periods of low spot rates," he says, and "the long-term tankship rate is expected to be lower than the short-term, under normal conditions." If normal conditions mean a situation of comparably high tone, it is acceptable to us. In evidence he states, "if we assume certainty and exclude economies of scale in long-

term contracts, the long-term rate would be approximately equal to the arithmetic average of the current spot rate and the expected spot rates over the interval covered by the long-term contract. For this reason alone, it is obvious that the long-term rate will not fluctuate as much as the short-term rate."

Removing the restrictive assumptions, he points out the reasons which cause the differences between long-term and short-term rates; (a) The uncertainties and expectations concerning the movement in spot rates over the period that the long-term contract covers: (b) The risks of unemployment that are eliminated by the long-term agreement: (c) The nuisance of frequent contracts: (d) The savings in the administrative costs and the brokerage fees: (e) The mortgageability of the long-term contracts. For these reasons he also appreciates the importance of his seventh factor, the duration of the charter agreement. We did, moreover, combine this factor with the lead time to our own factor, the prepositive time.

Among the above reasons, we take a special interest in the expectation that he numbers also as his second factor. He states, "the expectation of the buyers in the tankship markets are over-all elastic. ...If a buyer expects the short-term rates to increase proportionately more in the future than the present rate increase, he will also expect future long-term rates to follow in sympathy. In fact the impact of expectations, based on spot rates, may be so great as to distort any correlation between short-term and long-term rates. That is, once the short-term rates generate expectations they may become captive of their own creation."

As to the far-off future, he mentions, "Because of the uncertainties in the movement of short-term rates over an extended period of time, it is natural to expect decisions to be made on the basis of deviations from the static long-run costs. This is the only objective criterion available to the owners and will logically serve as a point of departure, especially for those whose imaginative anticipation of future short-term conditions is not very strong. The deviations from this cost-based, long-term rate will be determined by the short-term conditions that are expected to prevail, but will grow fainter and fainter as the duration of the charter is extended."

Thus, he draws a graph as shown in Fig. 4 and states, "Theoretically, there is an infinity of such curves corresponding to the infinite number of possible short-term rates. When the spot rate is below the normal long-term rate, the market long-term rate will tend to be greater the longer the duration of the contract. On the other hand, when the short-term rates are very high, the market long-term rates will be lower the longer the charter's duration."

The main differences between what he draws and what we imagine lie in two points: The Zannetos' long-term rate curve is an actual and explicit chain of points, each of which is placed by the level and duration of a long-term contract. While, our expectation curve is an imaginary and implicit chain of similar points that a man in

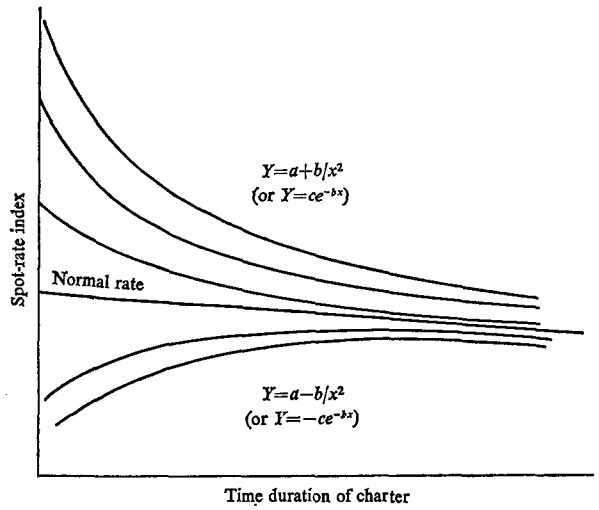


Fig. 4. Charter Duration and its Impact on Charter Rates (Zannetos)

the market expects at the moment of his bargaining. As far as our ex-post expectation curve is concerned both are almost identical with the exception of the length of the duration: We are considering the rates in a somewhat abstract way, so that we have pointed out only three factors to affect the future rates, the current rate level, the expectation coefficient and the prepositive time, which we classified in a more generous way. The other factors suggested by Zannetos are, as already mentioned, absorved in these factors in a certain sense, and some of them are to be removed in the course of making data.

6. Shape of Expectation Curve

We have considered the expectation curve to be a straight line. But in a sense it may be of a more complex shape. The expectation curve which the people in the market have in their minds are not so clear that we can draw them explicitly in a graph. The curve may be a straight line for a very short time in the future while it may become dim in a far-off future. Or otherwise, at least, it may converge at some level like as the normal level of Zannetos.

We will pursue the shape and nature of the curve in a stricter way. Approximately we can imagine that the curve; (1) has an intercept by the evaluation on the current market level; (2) has a rising or falling gradient toward the future for a while; (3) and in more distant future it may approach a horizontal line with a certain level.

(1) The current market level is rather difficult to evaluate. At the moment a fixture is reported to us, the news is nothing than a past event. It will only be an

event in the immediate past, when we are going to our own bargaining. Are we going to determine our own rates higher or lower than that? How do we evaluate the market level at this instant of time? All depends upon our own critique on the changes thereafter of the situation that has created the latest fixtures. Informations at this instant of time are nothing else than what can be now seen and what can be now heard.

Zannetos adopted the spot rates, as intercept of the ex-post expectation curve, at the moment of or its neighbourhood of the determination. We imagine no such explicit rates, however, when we consider the real time rate which is a clearer terminal point of the expectation curve. The problem for us will be at which point on the vertical axis the curve starts, the curve which is formed in the future. "What kind of actual consequences can occupy the same moment as the decision which aims at them?"(5)

A real time rate does also consist of the many fixtures fixed during some spread of time, so that it may be an average level evaluated by many parties. But it is obvious that the rate has consequently given an important effect to their fixtures. We, therefore, want to attach importance to the changes of this factor rather than to the actual rates.

(2) The prospect on the changing phases of the market levels from the next moment of the fixture to the foreseeable future may have a direction along a straight line. It is not a mere extrapolation of the past inclination, as Bross says.(6) As far as it is an extrapolated one, it will keep a monotonous inclination. We may, therefore, consider it as being a trend along an almost straight line, unless we think about the distant future.

Above all, we assume that the expectation curve is formed in the minds of the men in the market. Though they have a huge forecasting organization, their conclusion can only improve their confidence to their own expectation curves, and not make the curves complex. Of the seasonal fluctuations and of the substantial projects planned by the important party, broadly known informations are already taken into consideration in the current market tone, and can add no more complexity to their expectation curves.

(3) How excellent an intuition a man may have, or how scientifically precise a forecast may be, confidence in them must be much smaller the more it concerns the far future. For this reason, the farther in the future, the less fixtures are made. As Zannetos says, they may become rational expectation, and converge at the level of long-term cost or the long-term stable level. In the far-off future, the expectation

(5) Shackle [7] p. 42.
(6) Bross [1] chapter 3.

curve may become dim and meaningless for the market level.

From the fact that the long-term rates converge at a stable level in the distant future, we must not conclude that the shorter rates may also be around the converging line. The shorter rates owe to the expectation curve, while the longer rates have no explicit curve to owe to, other than the long-term stable level. The shorter and longer rates are owing to different logics. Zannetos suggested it too, but his long-term rate curve was continuous. Or this may be so because his curve contained no shorter rates which are owing to the expectation curve.

7. The Transient Expectation Curve

One of our motives to take the expectation curves of shipowners and charterers is to consider how they utilize their own expectation in their bargaining processes. As it is not convenient for us to assume a curve deliberately complex and to bring difficulties into our theory, we assume a simple line with a limit of the short prepositive times. That is, we imagine the expectation curve as representing a straight line which starts from a point b on the vertical axis and has a gradient of m, as shown in Fig. 1.

At the same time, whichever shipowners and charterers feel the current market level to be high or low, they may anticipate that the market will be back to a level in the far-off future. The idea that the current level can never remain as it is for ever is very natural without consideration when it may change the level and what level it may go back to. If so, a man having an expectation curve like AA' in Fig. 5 must expect the time when the market level will at last become static on the level CC' in spite of his evaluation as to the current level. This may be a regulating effect in his deep mind.

Hence, we face the ambiguity that he will owe to his expectation curve for a shorter contract, and on the other hand, that he will consider a rate of a longer contract due to his idea of the static level. What contract duration does he consider as being long and what short? Without solving this problem, we can not use this theory

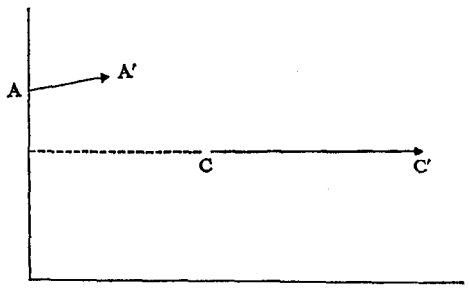


Fig. 5. Two Phases of Expectation

in our further study of the bargaining processes.

At the time when the market is favouring the shipowner, he can strongly insist on the rate prospected by his short-term expectation curve. But his idea will not be accepted by a charterer as it is unless his offer is a very short and prompt one. The confidence in his success in the bargaining process depends upon the prepositive time length of his offer. He cannot insist on the rate near the current level for a contract of longer prepositive time. According to an empirical study(7), it is possible to make a charterer accept the level which a shipowner now believes adequate for a contract of within 3 to 4 months in prepositive time. While a contract of 8 months or more in prepositive time must depend only upon the long-term static level.

The whole phase of the expectation curve which the men in the market have will be divided into two parts, the short-term and long-term portions. As the prepositive time becomes longer, the curve will gradually shift from the short-term to the long-term static level. Contracts of within 3 months in prepositive time can successfully be on or around the short-term expectation curve, while longer contracts will be far from it and approach the long-term static level. And at last contracts of as long as over 8 months will be almost along the latter. We can consider such a curve for its similarity to be a transient curve. And the rapidity of transition from

(7) Yoshida [10], he computes the total expected entropy from the probability matrices for each prepositive time. Each matrix contains 3×3 combinations of the cases, up, even, and down, in prospects and results which are extracted from the data we used above. One of his results will be shown in Fig. 7.

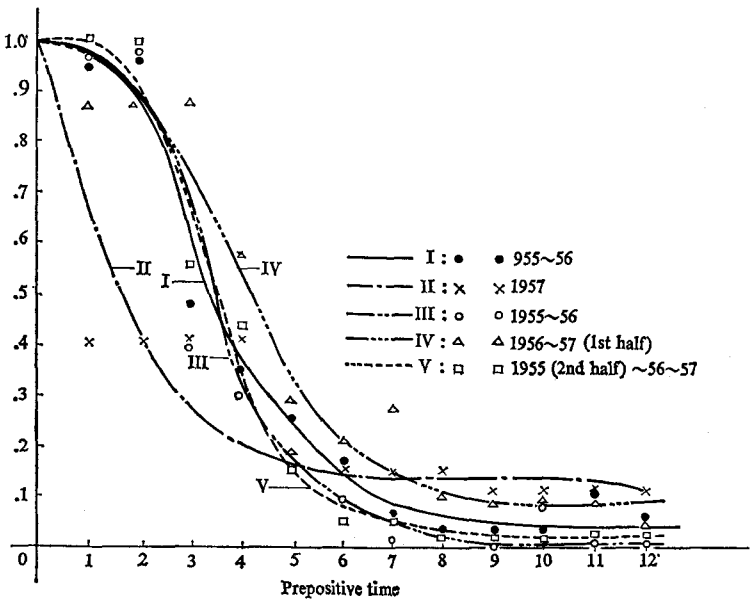


Fig. 7. Confidence in Expectations

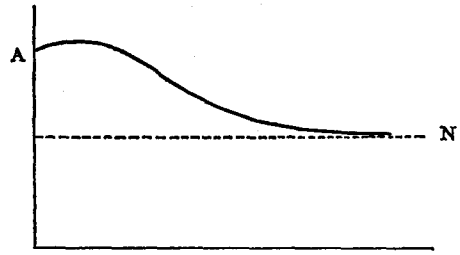


Fig. 6. A Transient Expectation Curve

one to the other is due to the market situation and the personality or the risk preference of those concerned.

A transient expectation curve may be as shown in Fig. 6, which is only a sample. This curve is drawn for the situation where the current market level is well above the long-term static level. We will denote the intercept as Actual Level or abbreviate A, and the long-term static level as Normal Level or N. Needless to say, we can draw other curves as for the opposite situation. In general, this curve seems to have the following characteristics:

(1) When the prepositive time is very short, this curve coincides with the short-term expectation curve with an intercept at A.

(2) When the prepositive time is adequately long, the curve will approach the normal level or the long-term static level without limit.

(3) The curve may be real in every point between the case (1) and the case (2), and no point can be away from its neighbourhood. Thus we can assume this curve as being continuous.

8. To a Bargaining Process Model

The transient expectation curve with these characteristics can express better the bull and bear attitudes or the risk preference than the linear expectation curve. Fig. 6 is of a rather extreme case, where the short-term expectation is in an upswing in spite of the high tone of the current market—a very bullish case. We can draw an infinite number of curves between the finites A and N. In any way, one of these curves will be an initial condition of the bargaining process. The ideas of the shipowners and charterers will be drawn from their own curves, and then, they step up to each other in the bargaining process. What we want to do with these tools is to trace the process and to find out the factors affecting the final fixtures.

The transient expectation curve is an assumption to be used in observing the process through which a man creates his idea. We suppose that everybody has always his own rate schedule corresponding to any variation of the prepositive time to

propose a rate idea whenever he is requested to do so. The transient expectation curve is also considered to be a locus of the points which will give him the same utility of contracts offered by others. This fact can mean an indifference curve. The theoretical tracing of the bargaining process can be made along the meeting process on the indifference surfaces of both shipowner and charterer.

There are still some difficulties in the empirical inquiries to this theory. It will be rather easier to assume an equation satisfying the various conditions, than to estimate parameters from actual data, to interpret them, and to extract informations needed for market forecasting from changes of the parameters. These will be investigated more deeply at another occasion.

REFERENCES

[1] Bross, Irwin, D. J., *Design for Decision,* New York, 1953.
[2] Lewis, Arthur, "The Interrelation of shipping Freight," *Overhead Costs,* London, 1951.
[3] Maeda, Yoshinobu, "Relation between Freights and Charterages" (in Japanese), *Kōnan Ronshu,* No. 5, Dec. 1954.
[4] Maritime Research Inc., *Chartering Annual,* 1955, 1956 and 1957.
[5] Sawa, Sempei, *Introduction to Shipping Dynamics* (in Japanese), Tokyo, 1962.
[6] ————, *Economics of Elasticity* (in Japanese), Tokyo, 1967.
[7] Shackle, G. L. S., *Decision, Order and Time in Human Affairs,* Cambridge, 1961.
[8] Shimojo, Tetsuji, "The Quantitative Analysis of Shipping Markets—A Survey weighting on Japanese Works—," *Annual Review of Kobe University of the Mercantile Marine,* Jan. 1973.
[9] Weston, W. G., "Short-term Freight Market Forecasting," *Westinform Shipping Report,* No. 50, 1955.
[10] Yoshida, Shigeru, "Risk Preference in the Shipping Markets" (in Japanese), not published.
[11] Zannetos, Z. A., *The Theory of Oil Tankship Rates,* MIT Press, 1966.

INTERNATIONAL CAPITAL MOVEMENTS AND REAL CAPITAL ACCUMULATION

Kazuhiro IGAWA

In treating the topic of real capital accumulation in an open economy, we must at the start clarify a number of points. This is because there is a vast literature explaining rather different economic phenomena within the framework of using similar terminology, which would involve us in a waste of time to understand completely.

(i) International capital movements: In some literature this term refers to direct foreign investment. It is usual in such literature that real capital moves internationally and the marginal productivity of capital is equalized in every country. In considering the actual world economy, however, it is more acceptable to interpret such capital movements in two steps: real capital investment and portfolio investment. Real capital movements can be interpreted as an increase in investment of real capital in one country which is financed by portfolio investment of foreign countries, and a disinvestment of real capital in other countries with a corresponding decrease in portfolio investment in the first country.

(ii) International portfolio investments are listed in the capital account in the balance of payments accounts, and movements of capital goods, some parts of which may be caused by direct investment, are kept in the trade account. Thus it is more convenient to confine the term "capital movements" to the international portfolio movements and we will use the term in this context.

(iii) Capital accumulation could include not only real capital accumulation but also financial assets accumulation. But it is better to use this term only for real capital accumulation. This is because we easily can capture an accumulation of financial assets, by looking at international portfolio movements. Thus, we reserve the term "capital accumulation" to refer to real capital accumulation.

Taking into account the above three points, we will show how international capital movements affect capital accumulation in a more realistic world. First we will investigate capital accumulation in a world of no capital movements in order to make clear the effects of capital movements. We will find that the capital accumulation process is affected by international trade, but its long run equilibrium (stationary) level is not affected. Next we will introduce international capital movements in the model and will find that not only the process of capital accumulation but also the long run stationary level of real capital are affected by capital movements.

I

We can set up the following simple model to investigate the fundamental relations of capital accumulation in an open economy.

(1) Goods and assets are aggregated into four classes. One is goods which can be used either for consumption and/or investment. Second is real capital which is a fundamental factor for production. Third is bonds which are issued to correspond to the stock of real capital. Those goods, bonds and real capital are homogeneous among different countries. The fourth is money, and under the fixed exchange rate system money can be treated as if it were internationally homogeneous.

(2) Perfect competition prevails in all markets, and the three types of economic agents in our model behave as follows. Households act so as to maximize their utility; firms produce goods in an efficient way and also decide an investment (increase or decrease of real capital); the government, including the monetary authority, determines policy variables.

In this context, we can assume the following supply and demand functions for a closed economy, which are familiar from the usual economics textbook.

(i) Supply of goods: the aggregate production function is

$$(1) \qquad X=F(K)$$
$$dF/dK=F_K>0$$
$$d^2F/dK^2=F_{KK}<0$$

where X is output and K is real capital.

(ii) Demand for goods: aggregate demand for goods is the sum of consumption, investment and government expenditure, and can be expressed in real term as

$$(2) \qquad D=D(r, y, a)$$
$$\text{and } \partial D/\partial r=D_r<0$$
$$\partial D/\partial y=D_y<0$$
$$\partial D/\partial a=D_a<0$$

where r is the rate of interest on bonds, y is real income and "a" represents real balances, that is, $y=Y/P$ and $a=M/P$, where Y is the level of money income, M is nominal money supply level and P is price level of goods.

(iii) Supply of bonds: bonds are issued exactly corresponding to real capital, which can be interpreted as a specific way of financing investment. Thus we can consider K as the supply of bonds.

(iv) Demand for bonds: aggregate demand for bonds can be expressed in a similar way to equation (2), as

$$(3) \quad B=B(r, y, a)$$
$$\partial B/\partial r=B_r>0$$
$$\partial B/\partial y=B_y>0$$
$$\partial B/\partial a=B_a>0$$

where B expresses the units of bonds. The rate of interest on bonds is expressed as the ratio of interest payment per unit of bond to the price of bonds,

$$r=R/Q$$

where R is the interest payment per unit of bond which correspond to unit of real capital and Q is the price of a bond. R is determined by the value marginal productivity of real capital and can be expressed as $R=PF_K$.

(v) Supply of money: under a flexible exchange rate system the supply of money is a policy variable, but under a fixed exchange rate system it is determined endogenously, reflecting balance of payments surpluses and deficits.

(vi) Demand for money: the aggregate demand for money can be expressed in real terms as

$$(4) \quad L=L(r, y, a)$$

while the demand for money in value terms is PL.

Using the supply and demand functions of above, we can get market equilibrium relations in a closed economy as follows.

(i) Goods market

$$(5) \quad X=D(r, y, a)$$

(ii) Bond market

$$(6) \quad K=B(r, y, a)$$

(iii) Money market

$$(7) \quad M=PL(r, y, a)$$

Assuming no government taxes, disposable income becomes

$$y=Y/P=F(k)$$

Alternatively to the interest rate on bonds, we can use the relative price of bonds to goods, this is because,

$$r=R/Q=F_KP/Q=F_K/q \quad \text{where } q=Q/P$$

One of the three equations (5), (6), (7) is not independent, in view of the constraint expressed by Walras' Law,

$$(8) \quad y=D+q(B-K)+(L-a)$$

We can call this short run (temporary) equilibrium, and from the equilibrium conditions we can determine the price level of goods and the interest rate on bonds, given level of real capital and money supply and assuming the existence and stability

of the system.

K and M can be treated as exogenous in the short run but will be endogenous in the longer run. M is policy variable in a closed economy and we can assume that it is a constant. A change in the level of real capital is determined by the investment function. Firms decide on their plans to invest, considering future profits, and in a simple case, this can be expressed as follows.

$$(9) \qquad \dot{K}=I(r, K)$$
$$I_r<0,\ I_K<0$$

When real capital and money supply do not change any more we will call it long run (stationary state) equilibrium. From the short run relations we can consider r as a function of K, and we will get long run equilibrium real capital stock K, by putting $\dot{K}$ equal to zero, if the system is stable.

II

Before considering the goods market in an open economy let us assume that the country is in a situation of long run equilibrium, that is

$$\begin{cases} X=D & a=\hat{a} \\ K=B & r=\hat{r} \quad (L.R) \\ I=O & K=\hat{K} \end{cases}$$

where $\hat{a}$ is the long run real money supply and $\hat{r}$ is the long run interest rate on bonds.

Let us first consider the case of a small country. When the country begins to trade, it will export (or import) goods if the domestic price level of goods is lower (higher) than the world price level. Corresponding to the balance of trade, the money supply of the country will increase or decrease, under a fixed exchange rate system or gold standard exchange rate system. Given a world price level P^*, the short run equilibrium conditions become as follows.

$$(5\text{–}1) \quad X=D(r, y, M/P^*)+T$$
$$(6\text{–}1) \quad K=B(r, y, M/P^*)$$

where T is the balance of trade. From these equations r and T (instead of P) are determined, given M, K and P^* and assuming the markets to be stable.

The dynamic adjustment equations are

$$(9) \qquad \dot{K}=I(r, K)$$
$$(10) \qquad \dot{M}=P^*T$$

assuming for simplicity that the dynamic adjustment is stable and non-oscillating, the adjustment process will be as follows. If the initial price level $\hat{P}$ is lower that P^* then T is positive and r will become higher than $\hat{r}$, considering equation (6–1). Thus,

$\dot{K}$ is negative and $\dot{M}$ is positive, at first stage. When K becomes sufficiently low, r will become lower than before and because of these two, $\dot{K}$ will become zero. But, $\dot{M}$ is still positive and r becomes further low level and $\dot{K}$ will become positive, in later stages of adjustment. Increases in M make T (and $\dot{M}$) small and increases in K make $\dot{K}$ small. Since the long run equilibrium situation is the same as before, the variables will return to the same values as before, $\hat{a}$, $\hat{K}$, $\hat{r}$, in equations (*L. R*), except that $\hat{P}$ becomes P^* and M becomes M^*.

If $\hat{P}$ is higher than P^* then the reverse adjustment will occur, that is, M will become M^* which is smaller than before and K will increase at first and return (at a later stage) to the original level $\hat{K}$. The long run equilibrium situation is the same as before. This is the well known gold specie-flow mechanism and it is not surprising that even in the non-small country case, the same thing happens and the only difference is that P^* is determined in the system.

In the case of flexible exchange rates, the foreign exchange rate changes so as to bring about a balance of trade equilibrium. As can be easily seen, we would get the same long run equilibrium situation under a flexible exchange rate system.

III

So far we have considered the case where only commodities are traded internationally. If international capital flows are allowed; the situation will be different even in long run equilibrium. This is mainly because a balance of payments equilibrium does not necessarily imply an equilibrium of the trade account itself. It is possible that the trade account is positive (or negative) and the service account is negative (or positive) because of international net negative (or positive) indebtedness, and the balance of payments is in equilibrium.

First we will consider the small country case. The short run equilibrium conditions are:

$$(5\text{–}2) \quad X=D(r^*, y, M/P^*)+T$$

$$(6\text{–}2) \quad K=B(r^*, y, M/P^*)+C$$

where C is bond holdings by foreign countries, if it is positive. If C is negative, it expresses holdings of foreign bonds by this country, in terms of the unit of bond of this country. We can determine C and T given K and M and the world price P^* and the world interest rate r^*.

We must note two points regarding the above equilibrium conditions. First, the existence of an internationally homogeneous bond does not imply that the price of the bond itself is equal but rather implies that the interest rate for the bond is equal, so that if the marginal (value) productivity of capital is higher in this country than that for the world, then the bond price of this country is higher than the world

price. Thus, the marginal productivity of capital is not necessarily equalized across the world. Secondly, in disposable income we must now include international interest payments or receipts. This will give us equation (11).

$$(11) \qquad y=F(K)-F_K C$$

where F_K reflects the fact that the real interest payment for unit bond is determined by the marginal productivity of real capital. We must note that the rate of interest on bonds is adjusted through a change in the price of bonds, as mentioned above.

We will now determine the effects of a change in M and K on the short run equilibrium value of C and T. These effects are useful for an investigation of the dynamic adjustment mechanism. From equations (5–2), (6–2) and (11), we will get the following simultaneous equations.

$$(12) \qquad \begin{bmatrix} 1 & -D_y F_K \\ 0 & 1-B_y F_K \end{bmatrix} \begin{bmatrix} dT \\ dC \end{bmatrix} = \begin{bmatrix} F & -D_y(F_K-F_{KK}C) \\ 1 & -B_y(F_K-F_{KK}C) \end{bmatrix} dK + \begin{bmatrix} -D_a/P^* \\ -B_a/P^* \end{bmatrix} dM$$

which in turn yield

$$(13) \qquad \frac{dT}{dK}=\frac{1}{\Delta}\begin{vmatrix} F_K-D_y(F_K-F_{KK}C) & -D_y F_K \\ 1 \quad -B_y(F_K-F_{KK}C) & 1-B_y F_K \end{vmatrix}$$

$$(14) \qquad \frac{dC}{dK}=\frac{1}{\Delta}\begin{vmatrix} 1 & F_K-D_y(F_K-F_{KK}C) \\ 0 & 1 \quad -B_y(F_K-F_{KK}C) \end{vmatrix}$$

$$(15) \qquad \frac{dT}{dM}=\frac{1}{\Delta}\begin{vmatrix} -D_a P^* & -D_y F_K \\ -B_a P^* & 1-B_y F_K \end{vmatrix} < 0$$

$$(16) \qquad \frac{dC}{dM}=\frac{1}{\Delta}\begin{vmatrix} 1-D_a P^* \\ 0-B_a P^* \end{vmatrix} < 0$$

where

$$\Delta=\begin{vmatrix} 1 & -D_y F_K \\ 0 & 1-B_y F_K \end{vmatrix} < 0$$

If it is assumed that $F_{KK}C$ is very close to zero, then dT/dK, and dC/dK become positive. On the other hand dT/dM and dC/dM are negative. These can be explained as follows.

(i) An increase in real capital will normally increase disposable income, and the demand for goods and bonds. But the increase in the supply of goods and bonds will be greater than the increase in domestic demand for them, because the income effect is normally positive and less than one. Therefore foreign demand for goods and bonds must be increased to attain market equilibrium.

(ii) An increase in the money supply increases real balances, which in turn increases the domestic demand for goods and bonds; therefore the foreign demand for goods and bonds must be decreased to clear the market, because the supply does not change.

Dynamic adjustments are expressed as

(9–1) $\dot{K}=I(r^*, K)$

(10–1) $\dot{M}=P^*L(r^*, y, M/P^*)-M$

where $\dot{M}$ is equal to the balance of payments surplus (or deficit) and we are familiar with this relation—equation (10–1)—in the monetary approach. Linearizing these differential equations and we obtain the following coefficient matrix.

$$\begin{bmatrix} I_K & 0 \\ P^*Ly(F_K-F_{KK}C-F_KC_K) & L_a-1 \end{bmatrix}$$

where $C_K=dC/dK$

The trace of this matrix is negative and the determinant is positive. Thus the equilibrium is locally stable. The phase diagram is shown in Fig. 1.

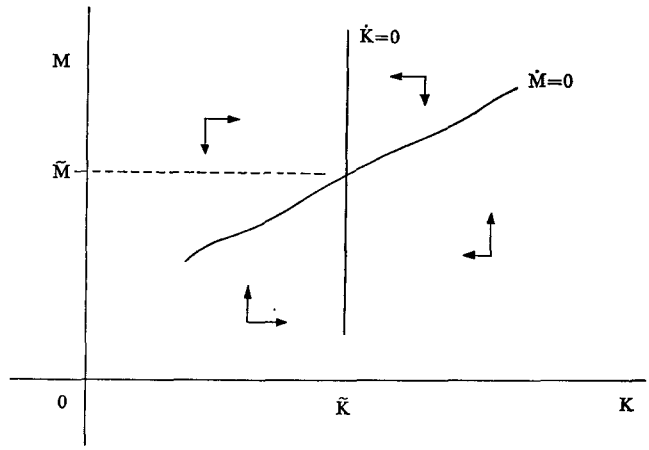


Fig. 1

If we can assume that $P^*L_y(F_K-F_{KK}C-F_KC_K)$ is everywhere positive and (L_a-1) is everywhere negative, this system is also globally stable. By taking the discriminant (D) i.e., (trace)^2–4(determinant)

$$D=(I_K+L_a-1)^2-4I_K(L_a-1)=(I_K-L_a+1)^2\geqq 0$$

We know that both roots are real and in the adjustment process there are no oscillations.

IV

As the dynamic adjustment path does not oscillate, it is easy to see the properties of the adjustment process if we know an initial position. Let us make clear the initial and terminal situations. A long run equilibrium can be obtained, putting $\dot{K}=0$ and $\dot{M}=0$. Including short run equilibrium conditions and given P^* and r^*, we will get

following long run equilibrium conditions with capital movements.

$$\begin{cases} & F(K)=D(r^*,\ F_K(K)=F_KC,\ M/P^*)+T \\ & K=B(r^*,\ F(K)-F_KC,\ M/P^*)+C \\ (17) & I(r^*,\ K)=0 \\ (18) & F_KC=T \\ & K=\tilde{K},\ M=\tilde{M},\ C=\tilde{C},\ T=\tilde{T} \end{cases}$$

The last equation can be obtained by putting $\dot{M}$ and $\dot{K}$ equal to zero in the following relation, which is known as Warlas' Law.

$$(19) \qquad P^*(y-D)+Q(\dot{K}-B)+\dot{M}=0$$

The initial situation is in long run equilibrium without capital movement given P^*, that is

$$\begin{cases} & F(K)=D(r,\ F(K),\ M/P^*) \\ & K=B(r,\ F(K),\ M/P^*) \\ (17\text{–}1) & I(r,\ K)=0 \\ (18\text{–}1) & T=0 \\ & K=\hat{K},\ M=\hat{M},\ r=\hat{r} \end{cases}$$

Although the last equation (18–1) can be derived from the first equation, we include it to make clear the difference between the two situation.

Adjustment processes are as follows. When the home country begins to allow for capital movements, foreign investors will buy domestic bonds if the interest rate on bonds is higher in the home country than in the foreign countries. That is, if $r>r^*$, then $C>0$. Because of the decrease in the interest rate, the demand for goods will increase and the trade account will worsen ($T<0$). But the balance of payments will be positive, because the demand for money has increased, and $\dot{M}>0$. The low interest rate also brings positive investment and $\dot{K}>0$. If the initial shock from capital movements is not very strong, non-oscillating adjustment mechanism gradually proceeds. In a later stage, the trade account will become positive, and must it be so, because of the increase of real capital and the increase of interest payments to the foreign country. The capital flow will be positive $\dot{C}>0$ as $\dot{K}>0$, but in the long run it becomes zero, and we will get the situation of $\dot{K}=0$ and $\dot{M}=0$.

If $r<r^*$, then the reverse adjustment will occur, that is, $\dot{M}<0$ and $\dot{K}<0$ during the adjustment process.

This implies that if $r>r^*$ ($r<r^*$) then the initial position of K and M are in the area below (above) the line $\dot{M}=0$ and to the left (right) of the line $\dot{K}=0$, in Fig. 1. What determines the relative size of the interest rate on bonds, will be discussed in the following section.

In the non-small country case, we cannot get as simple result for the dynamic

adjustment process as that above. In this case, not only the price level but also the interest rate will be adjusted so as to clear the markets, and a similar adjustment process may be followed for the long run interest rate and for the long price level. But, taking into account the fact that both countries (in two countries case) are accumulating real capital, the adjustment process will not be simple, and the conditions that the roots of the differential equations are real will not be satisfied even in the case when the system is globally stable.

Comparing the initial situation, i.e. long run equilibrium without capital flows—which is also a long run equilibrium for a closed economy—with the final situation, i.e. long run equilibrium with capital flows, we can see that the two equilibrium situations are different except for the trivial case in which the price of goods and the interest rate on bonds do not change.

It is difficult to decide whether capital movement will or will not produce a welfare gain for the home country. We can show this by using Fig. 2 and Fig. 3.

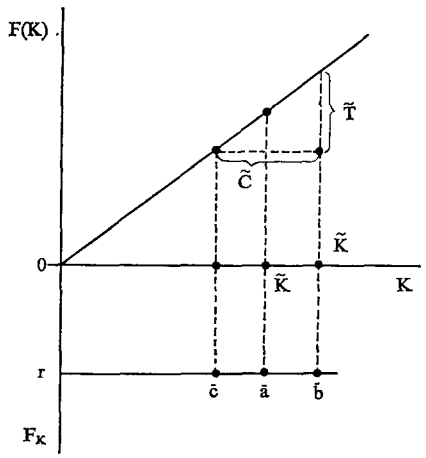


Fig. 2

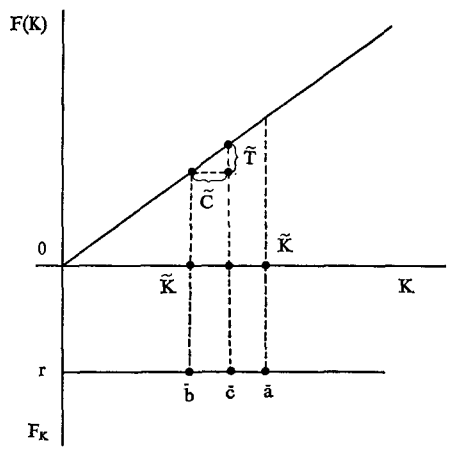


Fig. 3

We make the simplyfying assumption that the marginal productivity of capital is constant. Initial income is given by the rectangle $O\hat{K}\bar{a}r$, in short $(O\bar{a})$. The long run equilibrium output and income are given by the rectangle $(O\bar{b})$ and $(O\bar{c})$ respectively, point $\bar{c}$ is obtained by using the relation that $\tilde{T}$ is equal to $F_K\tilde{C}$. As will be easily seen if point $\bar{c}$ is to the left to point $\bar{a}$, this country will suffer a welfare loss, measured by income. We can make the case that this country will have a welfare gain, when point $\bar{c}$ is to the right of point $\bar{a}$. A more complicated analysis would be called for, if we were to consider the case of a decrease in the marginal productivity of capital.

V

As a concluding section, we will discuss the following two points.

(i) We found, in the previous section that the international trade of goods does not of itself change the long run equilibrium situation. Thus, most of the policy interest will be on the process of adjustment. But capital movements will alter the long run equilibrium position and the welfare level of the country. Therefore, in this case, it is natural for the country to choose policies that will prevent unfavorable effects from capital movements, by looking at a welfare level measured by income or by looking at optimum capital accumulation level, or some other indices. It will also be important to follow policies which reflect a desirable adjustment process even the long run equilibrium is a desirable situation.

(ii) In the previous section, we discussed the adjustment process of two alternative situations, i.e. $r>r^*$ and $r<r^*$, without explaining why it happens to be the case. This is a similar problem to the "comparative cost" or "Heckscher-Ohlin" trade theory, and the problem in this context is what gives rise to the difference in interest rates on bonds among countries. We do not intend to give a complete answer to this question in this paper, however, we will mention three causes which explain it. One is an investment function. If capital accumulation is higher (lower), because of a high (low) investment rate, the marginal productivity of capital will be lower (higher) and the interest rate on bonds will be lower (higher). Another is the technique of production. If at the same real capital level, the marginal productivity of capital is higher (lower) in some country, then the interest rate on bonds will be higher (lower) in that country. The third factor has to do with the demand for bonds. If demand is relatively biased (not biased) toward bonds then the interest rate on bonds will be lower (higher), because the price of bonds will be higher (lower). The interest rate will also be affected by the stage of financial development and by the institutional financial mechanism itself. To tackle the problem from the financial side it is necessary to use a model which treats mainly financial assets and financial institutions, which is beyond the scope of this paper.

REFERENCES

[1] S. Fischer & J. A. Frenkel, "Investment, the Two-Sector Model and Trade in Debt and Capital Goods," *J. Int. Econ.*, Aug. 1972, 2.

[2] J. A. Frenkel, "A Theory of Money Trade and the Balance of Payments in a Model of Accumulations," *J. Int. Econ.*, May 1971, 1.

[3] E. Sakakibara, "A Dynamic Approach to Balance of Payments Theory," *J. Int. Econ.*, Feb. 1975, 5.

THE LEGAL SYSTEM OF THE FREE MOVEMENT OF WORKERS AND MIGRATION TRENDS IN THE EUROPEAN ECONOMIC COMMUNITY

Kunio SOH

The purpose of this study is to go into the EEC's legal system on the free movement of workers and the migration movement in the European Economic Community. EEC's provisions and legislations on the free movement of workers will be described in the first and second part of the study, and the migration movement of the Community will be examined in the third part, in the fourth part conclusions will be summarized.

I. Workers and Social Objectives of the Community

The purpose of the EEC is not to attain merely economic objectives which would have the effect of improving the living conditions of the nationals of the Member States, but also to fulfil social objectives laid down by the Treaty. In the first phrases of the preamble to the EEC Treaty the heads of state of the six signatory governments declare themselves on the social objectives of the Community as follows:
RESOLVED to ensure by common action the economic and social progress of their countries by eliminating the barriers which divide Europe,
AFFIRMING as the essential objective of their efforts the constant improvement of the living and working conditions of their peoples,
ANXIOUS to strengthen the unity of their economics and ensure their harmonious development by reducing the differences existing between the various regions and the backwardness of the less favoured regions.

Article 2 of the EEC Treaty from this standpoint provides that the Community shall have as its task, by setting up a common market and progressively approximating the economic policies of the Member States, to promote throughout the Community—a continuous and balanced expansion of economic activities, an increase in stability, an accelerated raising of the standard of living—. Article 3 of the Treaty further provides that the activities of the Community, for the purposes set out in Article 2, shall include, on the conditions and in accordance with the time-table provided in this Treaty:—(c) the abolition, as between Member States, of obstacles to freedom of movement for persons;—(i) the creation of a European Social Fund in order to improve the possibilities of employment for workers and contribute to

the raising of their standard of living—.

From this it is clear that the objectives of the social character of the Community are ranked very high amongst the aims of the Community,[1] although the legal framework of the Community's action in the social field is less rigid, except in some points more directly linked with the attainment of the common market.

II. EEC's Provisions and Legislations concerning the Free Movement of Workers

In pursuit of the objective of the abolition of "obstacles to the free movement of persons—" as defined in Article 3 (c), EEC, the Treaty seeks to secure within its territorial application the operation of a principle of non-discrimination in regard to wage-earners and persons subject to a contract of employment contained in Articles 48 to 51, EEC, under the chapter heading "Workers," while self-employed persons are subjected to the rules on freedom of establishment contained in Articles 52 to 58, EEC, under the chapter heading "Right of Establishment." The free movement of "Workers," therefore, relates only to persons who are employed by others and not to those who are self-employed.

The free movement of persons, more specifically, of workers, is one of the "four freedoms" of the EEC. In an economic unit such as the Community and in an economically and technologically changing society, the use of manpower is an important measure, and thus workers must be able to move wherever they are most needed. Arts. 48 to 51 lay down the principles for the free movement of workers and provisions for the social security of Community migrant workers.[2] The problems on the social security for migrant workers will not be dealt with in this study.

Art. 48 establishes a framework of guide-lines which seek to identify and thence to remove the obstacles to the common policy of the Community which are to be found in many types of national legislation which discriminate against the foreign migrant workers.

Art. 48 (1) provides that this freedom of movement is to be secured by the end of the original transitional period "at the latest." As this is in absolute terms, the Article may perhaps be considered to have become directly applicable with the expiry of this period on December 31, 1969. In fact, a series of Regulations and Directives were promulgated and issued between 1961 and 1970 in order to meet the demands

(1) It would seem that the provisions of Article 2 have to be read and applied in the same way as the comparable provisions of Arts. 2 and 3 of the ECSC Treaty.

(2) The general scope of the Articles 48 to 51 is more comprehensive than the isolated provisions of Art. 69 of the ECSC Treaty and Art. 96 of the Euratom Treaty which deal only with specialised categories of workers from the relevant industries.

of this time-table.

Art. 48 (2) defines the freedom of movement as entailing the abolition of any kind of discrimination based on nationality between workers of Member States as regards employment, remuneration and other conditions of employment. But, this Art. 48 (2) does not define "workers of the Member States" nor qualify this expression by reference to skilled, semi-skilled, or unskilled occupations. According to the judgement of the Community Court, the "workers" concerned include all empolyees, not merely manual workers;[3] and the concept of workers arises not from internal national law but from Community law and not only a present worker but also one who, having left his job, is capable of taking another.[4] On the other hand, the concept of the worker concerned also is applied to the phrase "wage earners and assimilated workers" according to Art. 4(1) of Regulation 3 of 1958 (O.J. 1958, 561), but in that context of the phrase it is interpreted in relation to the social security matters with which Art. 51 of the Treaty and Regulation 3 are concerned.

These "workers of the Member States" are nationals of Member States of the Community as defined in the Regulation 1612/68 (O.J. 1968, L257/2), but by a Decision of October 15, 1968, the Council of Ministers made Arts. 48 and 49, EEC, and their implementing instruments applicable to French Overseas Departments,[5] pursuant to Art. 227(2), EEC, and in practice stateless persons and refugees who reside permanently in one of the Member States are based on equal footing with nationals for the purpose of social security.[6]

This restriction of the concept of workers in Art. 48 to nationals of Member States is applied in the United Kingdom, the Republic of Ireland and Denmark as from January 1, 1973. However, as to the U.K., the defination of "nationals" and "nationals of Member States" or "nationals of Member States and overseas countries and territories," according to a Declaration (annexed to the Accession Treaty) by the U.K. Government, are to be understood to refer to:

(a) persons who are citizens of the U.K. and Colonies or British Subjects not possessing that citizenship or the citizenship of any other Commonwealth country or territory, who, in either case, have the right of abode in the U.K., and are therefore exempt from U.K. immigration control; and

(b) persons who are citizens of the U.K. and Colonies by birth or by registration or naturalization in Gibraltar, or whose father was so born, registered or naturalized.

As a result of the Declaration, it is clear that many who are in every ordinary

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(3) Vaasen-Göbbels v. Beambtenfonds voor het Mijnbedrijf (1966), *C.M.L.R.*, p. 521.

(4) Unger v. Bestuur der Bedrijfsvereniging voor Detailhandel en Ambachten (1964), *C.M.L.R.*, p. 319.

(5) The French Overseas Departments are Martinique, Guadeloupe, Reunion, and Guiana.

(6) Reg. 3/58, Art. 4; Reg. 1408/71, Art. 1(d), (e).

sense and in law citizens of the U.K. should be excluded from the freedom of movement that all other Community citizens are to enjoy.[7]

Art. 48(3) enumerates the rights arising from the principle of non-discrimination stated in Art. 48(2), and subjects them to justifiable limitations imposed by the host Member State on grounds of public policy, public security and public health. The principle of non-discrimination in the employment of workers assures equal opportunities without differentiation in the recruitment of workers by allowing the acceptance of specific offers (Art. 48(3), (a)), except where the special nature of the position to be filled is inextricably linked with certain linguistic requirements. It also includes the right to move freely in the Member States of the Community of Workers who have been so recruited (Art. 48(3), (b)), to reside in any such Member State in order to carry out duties under the contract of employment (Art. 48(3), (c)) and, most important, to remain there at the end of the term of employment subject to conditions to be drawn up by the Commission (Art. 48(3), (d)).

Art. 48(4) restricts the application of the prescribed freedom of movement by excluding from its ambit those employed in the public service. There is no definition of "public service" in the Treaty, but practice suggests that free movement extends to nationalized industries, whereas workers in public service or nationalized industries are less likely to move from country to country.

In order to establish effectively the freedom of movement for workers Art. 49, EEC, makes it clear that the principle of free movement of workers was to be achieved by progressive stages, as defined in Art. 48, in particular:

(a) by ensuring close collaboration between national employment service;

(b) by systematically and progressively abolishing such administrative procedures and practices and such qualifying periods for eligibility for available employment which are provided by domestic legislation and agreements previously concluded between Member States as an obstacle to the freeing of workers' movements; or

(c) for free choice of employment; and

(d) by setting up a system for the communication of job opportunities and a balancing machinery to equalize supply and demands, in such a way to avoid serious threats to the standard of living and of employment in the various regions and industries.

According to the provision of Art. 49, EEC, the Council is empowered to issue directives and regulations to this end, acting on a proposal from the Commission after consulting the Economic and Social Committee, so as to secure the implementation of the principle of free movement of workers defined in Art. 48, EEC.

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(7) See W. R. Böhning, *The Migration of Workers in the United Kingdom and the European Community*, 1972, pp. 316–69.

The implementation of the free movement for workers can be divided into three discernible stages, each stage being governed by a Regulation of general application. The first stage was inaugurated by the issue of Regulation 15 of August 16, 1961, O.J. 1961, 1073, followed by Regulation 18 extended the scope of beneficiaries of the freedom of movement to actors and musicians. Regulation 15 was replaced by Regulation 38/64 of March 25, 1964, O.J. 1964, 965 (the second stage) but was not superseded in substance, and Regulation 18 is still in force. The final solution upon the end of the transitional period was provided by Regulation 1612/68, O.J. 1968, L257/2, whereby Reg. 38/64 was replaced. The Reg. 1612/68 has been supplemented by a Commission Regulation 1251/70, O.J. 1970, L142/4. A Directive on the abolition of restrictions on the movement and residence within the Community of workers of Member States and their families was adopted with each Regulation, the existing one being Directive 68/360, O.J. 1968, L257/15. The principal contents of Regulation of each stage will be laid down as follows:

(1) In the first stage, Regulation 15 and a Directive of the same date sought to (a) abolish quota restrictions on labour movements between Member States, provide for the obtaining of specified occupation work permits from the intend host Member States, define the rights of migrant workers in regard to dismissal, trade union membership or affiliation, and in respect of their dependent family; and (b) to harmonise varying national rules within the Community as to documents to be carried by migrant workers and their dependants.[8] In addition, in order to co-ordinate information and resources with regard to job availability and the state of the Community labour market in general, a European Co-ordination Office, an Advisory Committee, and a Technical Committee were set up. In the stage, the priority of the national labour market for an initial period of three weeks was allowed by Reg. 15. But, an exception was made in respect of specified job offers made to named individuals who were nationals of other Member States; in such a case the named individual could accept the job offered at once.

(2) The second stage was based upon Reg. 38/64 of March 25, 1964 and a Directive of February 25, 1964 (O.J. 1964, 240). Reg. 38/64 allowed migrant workers to change jobs after two years (in Reg. 15 four years) abolished the minimal initial three-week national labour priority defined in Reg. 15. However, a safeguard provision was included (Art. 2) to persuit the Member State to reintroduce a limited national labour market priority of two weeks for periods of three months at a time,

(8) In this phase, special groups, such as frontier workers, seasonal workers, actors and musicians were not covered by Reg. 15, they were included in the latter Regulations 18 and 38/64.

in the event of an excess of labour in a particular region or industry.[9] But, the safeguard did not affect frontier workers or offers of positions to individually-named workers. The right of the migrant worker to be accompanied by members of his family was extended so as to comprehend, in addition to his spouse and minor children, other dependent children and dependent ascendant relatives. Directive 64/240 required modification of national rules on residence permits so as to allow the holder of such a permit to move anywhere within the host country for which it was issued. The validity of residence permits was also required to be co-extensive with that of work permits.

(3) In the third phase, Reg. 1612/68, which came into force on November 9, 1968, replaced Reg. 38/64 in its entirety and provided, for the first time, a general legal framework for the accomplishment of the objectives of Art. 48, EEC. The basic principles of this Regulation, as laid down in the first article, may be quoted here:

"1. Any national of a Member State, irrespective of his place of residence, shall have the right to take up an activity as an employed person, and to pursue such activity within the territory of another Member State in accordance with the provisions laid down by law, regulation or administrative action governing the employment of that State.

2. He shall, in particular, be eligible for employment vacancies in the territory of another Member State with the same priority as nationals of that State."

From this basic principle, Reg. 1612/68 covers all wage earners, including frontier and seasonal workers, the worker's spouse and children under 21 years of age or who are dependent upon him, if they pursue a wage earning activity, under equal conditions of employment. National workers no longer enjoy any priority, subject to certain important safeguards. A Community migrant worker is entitled to national treatment concerning housing in the host country. He may acquire ownership of a house and is entitled to be placed on the waiting list for houses, not only for himself but also his family. Equal access must be given to vocational training, schooling for his children. Community migrant workers are entitled to unrestricted membership in trade unions and have the right to vote. Formerly after three years and now from the inaugurating of their employment, they can hold office in the union, except when

(9) The safeguard clause defined in Art. 2 of the Reg. 38/64 was invoked by the Netherlands for the province of Overijssel for all occupations between April 1967 and April 1968, by France for certain areas and occupations up to July 1968 (in 1963 France maintained priority for French nationals as labourers, office workers and shop assistants throughout the country) when the American bases were closed and by Belgium for surface and underground miners in the provinces of Limbourg, Hainault and Liège. See H. ter Heide, the Free Movement of Workers in the Final Phase, *C.M.L.R.*, Vol. 6, No. 4, 1969, pp. 466–67, and A. Campbell, *Common Market Law*, Vol. III, 1973, p. 141.

it is combined with governing functions. All individual or collective contracts of employment which discriminate in their terms against Community workers in so far as access to employment, employment itself, wages or other conditions of work or discharge are concerned, are void by operation of law.

Directive 68/360, which accompanied Reg. 1612/68 on the same date (O.J. 1968, L257/13) provided for the issuance of a "Residence Permit for a National of a Member State of the EEC," on production by the worker of a valid identity or passport and a declaration from the future employer, to migrant worker.[10] The residence permit will be valid for a period of at least five years throughout the territory of the host country and will be automatically renewable. The permit may not be withdrawn only because of the holder is no longer working. The validity of the residence permit is not affected by an absence abroad up to six months or due to the performance of military service.[11] The contract of employment does not lose its validity as a result of illness, accident or involuntary redundancy affect it. Seasonal workers and workers whose employment is restricted to a period of between three and twelve months are permitted to accept temporary residence permits.[12] If the worker has been involuntarily unemployed in the host country for more than twelve consecutive months, the residence permit may be limited to a period of not less than twelve months at the time of the first renewal.

Thus, it may be said that the principles of free movement of workers have been accomplished since the end of 1968. However, the right defined in Art. 48(3), (d)" to remain in the territory of a Member State after having been employed "in that State..." was not covered by Reg. 1612/68. Reg. 1612/68 covers the case where a Community worker has taken up employment in another Member State and wishes to remain either when out of work due to accident, illness or involuntary unemployment or in order to take up another employment, while the Regulation fails to make provision for the case where the worker desires to continue his residence in the Member State after his retirement on reaching the age limit, after premature retirement owing to an industrial accident or an occupational disease, or if he takes up employment in an adjacent Member State. Moreover, it does not regulate the position of the surviving spouse and of the members of the family residing with the

(10) There is, however, an understanding by the Council that in order to forestall abuse of this provisions, a residence permit, which is still required, should not be issued if the worker has not found employment within three months, i.e., the unsuccessful job-seeker could be treated after three months as a tourist who had overstayed his permission to stay. See Böhning, *op. cit.*, p. 15.

(11) Württembergische Milchverwertung-Süd-Milch AG v. Ugliola (Case 15/69) *C.M.L.R.*, 1970, p. 194. See Campbell, *op. cit.*, p. 539.

(12) No residence permit is required if the migrant or seasonal worker enters for a period of less than three months. See K. Lipstein, *The Law of the European Economic Community*, 1974, p. 90.

worker.

For filling this gap mentioned above, Commission Regulation 1251/70, O.J. 1970, L142/24 provides that any Community migrant worker may continue to remain in that Member State if:

(a) he has reached the qualifying age for an old age pension and has been employed in the host state for at least the last twelve months, and resided there continuously for more than three years; or

(b) ceases work because of permanent incapacity to work, provided he has resided there for more than two years (no condition is to be imposed as to the length of residence if the incapacity arose from an industrial accident or occupational disease); or

(c) been a frontier worker (namely retaining his residence in the territory of the first state to which he returns, in principle, each day or at least once a week) after three year's continuous employment and residence in the territory of that state.

The requirements of qualifying period of residence and employment under (a) or of residence under (b) are waived, if the worker's spouse is a national of the Member State concerned. The same privilege is granted to members of the worker's family who resided with him before he died in the host state, provided that the deceased resided there continuously for two years, or if his death was due to an industrial accident or occupational disease, or if the surviving spouse is a national of the state of residence or was such a national before losing the nationality of that state by marriage to that worker.

Thus, the "embryonic rights of Community citizenship,"[13] as they apply to the migrant worker and his family, were promulgated in this series of Council regulations and directives. The existing Regs. 1612/68 and 1251/70 and Directive 68/360 apply also to the three new Member States as from January 1, 1973; but during the transitional period the U.K. may derogate in certain respects from the provisions of Regulation 1612/68 in relation to Northern Ireland, as may the Republic of Ireland, in relation to the whole of its territory (Act of Accession, Annex VII). Furthermore, it must be noted that citizens of the U.K. Colonies and Islands, i.e. citizens of the Channel Isles and Isle of Man, are excluded from benefiting from Community provisions relating to the freedom of movement for persons or services, i.e. Chapter 1, 2 and 3 of Title III of the EEC Treaty (Protocol No. 3 to the Act of Accession). Such persons are defined in that Protocol. They conserve, of course, their existing rights in the U.K.

Certainly, migrant workers of the Community are treated equally as nationals

(13) L. Levi-Sandri, *Bulletin of European Communities*, No. 11, 1968, p. 6. See Böhning, *op. cit.*, p. 19 and *Encyclopedia of European Community Law*, Vol. II, European Community Treaties, B10047.

of the host state on grounds of the principle of non-discrimination based on nationality between workers of the Member States as regards employment, remuneration and other labour conditions defined in Art. 48, EEC. On the other hand, as will be seen from the third part, the migration trends in the Community has increased rapidly since the early sixties, namely, just from the incipience of implement of the free movement for workers in the Community. Have these Regulations concerning the free movement of workers mentioned above provided an added incentive for Community workers to migrate within the Community? For answering this question, we shall examine the migration trends of the Community.

III. Migration Trends of the Labour Market of the Community

Manpower movements within the Community increased regularly between 1958 and 1961. They rose from 156,000 migrant workers in 1958 to 292,000 in 1961 (workers with work permits issued by Member States). However, three years later, migrations within the Community have decreased to below the 1961 levels and were put at 240,000.[14] After that, the EEC manpower resources were beginning to be used up, mainly because of the progressive industrialisation of Italy which is a major labour-supplying country in the Community.

In the case of Germany, the proportion of new Italian recruited entrants rose from 50% in 1958 to 65% in 1961 and decreased continuously from 46% in 1962 to 4% in 1970, while the proportion of new recruited entrants from the non-EEC countries, especially Greece, Turkey and Spain respectively have increased rapidly since 1960 and 1961 (41% in 1960 to 78% in 1970 for Greece; 31% in 1961 to 77% in 1970 for Turkey; 41% in 1960 to 83% in 1970 for Spain), Portguese increased from 58% in 1964 to 90% in 1970 and new entrants from Yugoslavia increased from 35% in 1969 to 53% in 1970. Thus, a widespread recruitement system in the Mediterranean area generally provides around two-fifth of the total annual influx of foreigners and between 50% and 90% of the influx from the Mediterranean countries themselves, while the decline of Italian new entrants to Germany had set in before 1964, i.e. before the EEC significantly freed the movements of workers.[15]

Certainly, the absolute number of Italian workers places a most important percentage amongst the number of all Community migrant workers (76% in 1972). In this sense, Italian Workers play a more important role than those of other Member States of the Community. But, today, Workers from Yugoslavia and Turkey outnumber Italians, who formed 40% of all foreign work-force till 1962 and formed only

(14) Campbell, *op. cit.*, p. 533.

(15) Böhning, *op. cit.*, pp. 34–35. The figure of foreign workers in the Community used in this study mostly quoted from a distinguished work written by Böhning mentioned above.

18% in 1972.[16] The reasons of the decline of Italian workers are mainly because of the progressive industrialisation of Italy itself. For this, Germany was compelled to seek its foreign workers on markets outside the EEC. Thus a series of bilateral agreements were signed between Germany and the Mediterranean countries between 1960 and 1968.[17]

In the case of France, the number of newly entering workers from Italy decreased steadily from about 88,100 in 1958 to 6,700 in 1970 and the proportion of permanent entrants from Italy fell from 62% in 1958 to 2% in 1970. Although the absolute number of Italians formed 80% of Community migrant workers in France in 1972, Italian workers formed less than 13% of all foreign workers in France, while workers from North African countries,[18] Portugal, Turkey and Yugoslavia rose sharply. Portuguese rose from 5,100 in 1958 to 91,600 in 1970, Turks rose from 200 in 1964 to 14,100 in 1970 and Yugoslavs rose from 500 in 1958 to 10,900 in 1970. The drop in the number of Italian new entrants was due to the Italian boom at the beginning of the sixties and the pull of German wage levels during that decade. Thus, in the case of France, the drop of migration from the EEC countries to France derives more from the mature character of the migration stream than from the freedom of movements within the EEC.[19]

In the case of Belgium, over 200,000 foreigners were resident in the country, in 1900 (3.1% of the population), 93% of them coming from neighbouring countries. Italian workers played an important part after the first World War, and they rose sharply during the early years of the post-war period because of heavy recruiting for the mining industry from 1947 to 1952. In 1956, there were serious pit disasters at Quaregnon and Marcinelle,[20] there was a drop in Italian emigration to the Belgium mines. Nevertheless, Italian workers play a still more important part as compared with those of other Member States in Belgium. In 1972, Italians formed 72.5% of

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(16) In 1974, there were a total of 2.49 million foreign workers in Germany. See Wirtschaft und Statistik, 11.74, S. 767.

(17) Recruitment agreements have been concluded between Germany and other countries mainly the Mediterranean area, such as Germany-Italy (December 20, 1955), Germany-Spain (March 29, 1960), Germany-Greece (March 30, 1960), Germany-Turkey (October 30, 1961), Germany-Morocco (May 21, 1963), Germany-Portugal (March 17, 1964), Germany-Yugoslavia (October 12, 1968).

(18) France's coloured immigrants can be divided into three groups:
(a) North Africans—Algerians, Moroccans, and Tunisians being the most important group numerically; (b) the people of Francophone Black Africa-being composed of the Cameroons, the Central African Republic, Congo (Brazzaville), Dahomey, Gabon, Guinea, the Ivory Coast, Madagascar, Mali Mauritania, Niger, Chad, Senegal, Togom and Upper Volta; (c) Black French from the four Overseas Departments (see note 5).

(19) Böhning, *op. cit.*, p. 31.

(20) I.C.E.M., "Italian Communities Abroad," *International Migration,* 1971, Vol. IX, No 1/2, p. 121.

all Community migrant workers and formed 39.5% of all foreign workers in Belgium. Furthermore, the share of nationals from EEC-countries is higher than those from non-EEC-countries (56% of the total foreign work-force in 1968). This is different from both cases of Germany and France. However, the influx of new entrants from the traditional labour suppliers of the EEC, especially from Germany and France, has been less variable than that from the more recent countries of origin, like Spain and Turkey, or from the extra-European countries. Since 1969, it seems that Belgium has been reconsidering its immigration policy and is attempting to reassert the primacy of the labour market for non-EEC-countries.

In the case of the Netherlands, at the beginning the last decade, the immigration gathered momentum with Italy providing between 20% and 40% of the new entrants. However, it was quickly overtaken by Spain, Turkey and Morocco. Italian new entrants decreased continuously from 3,200 in 1962 to 1,200 (EEC estimate) in 1970, while Spaniards rose from 5,500 in 1963 to 7,100 in 1970 and, Turks rose from 700 in 1963 to 6,900 in 1970. In recent years, the Italian work-force has become stationary at the 11,000 level. There are at least twice as many workers from neighbouring Belgium and Luxembourg (in 1957, Benelux formed a Common Labour Market) in the Netherlands as from Italy. In 1972, migrant workers of EEC countries stood at 41% (about 50,000, of which 12,000 Germans, 9,000 Italians, 1,700 French, 27,800 are workers of Belgium and Luxembourg) of all foreign workers (121,000, excluding Surinams and Dutch Antillians) in the Netherlands. However, it must be noted that the proportion (namely 41%) would stand at 26% if the number of Surinams and Dutch Antillians were included in the total foreign work-forces.

In the case of Luxembourg, the immigration of workers gathered momentum coming mainly from Italy in the fifties. However, the Italian new entrants decreased from 9,823 in 1961 to 551 in 1970, although their number in employment remained steadily at the 11,000 level since 1961. In 1970, Italian workers formed 39% (10,900 out of 28,700) of the Community migrant workers and formed 27% of all foreign workers (40,900) in Luxembourg. However, more important, it must be noted that the number of the total foreign work-force formed 37.5% of the total working population in Luxembourg.

Finally, in the case of Italy, although it is on the way to becoming an immigration country,[21] in the present stage that the migration from other EEC-countries to Italy is insignificant to be examined here, because Italy is a major labour-supplying country in the EEC and because foreign workers there form the lowest percentage (0.3%) amongst the Member States of the Community (see annexed table).

In addition, there is no examination into the migration movement in the U.K.,

(21) Böhning, *op. cit.*, p. 39.

Ireland and Denmark, because it is not the main objective of this study to examine the migration trends after the establishment of the EEC's system of free movement of workers since 1970, although, before that period, there were some workers of Germany and France emigrating mainly to the U.K.

Thus, although the composition of the immigrant work-force differs from country to country within the Community because of historical, geographical and economic reasons, all EEC-countries have received Italian workers, especially Germany, France and Belgium. It must be noted that the new entrants of Italy emigranting to other EEC-countries have decreased continuously since the early sixties, irrespective of the implement of free movement for workers of the EEC except for the case of Belgium, where Italians have been decreasing only since 1968. It must, also, be noted that workers from non-EEC-countries, especially the Mediterranean area and North African countries, have increased sharply since the early sixties, although they are unable to derive any benefit from the EEC's system on the freedom of movement for workers.

IV. Conclusions

After examining the EEC's legal system of the free movement of workers and migration trends in the Community, the following results can be found:

It has been noted that, although the principle of free movement of workers was accomplished in 1970, this does not mean that the workers of EEC-countries can freely (unconditionally) claim any job anywhere within the Community. Indeed this freedom of movement is not yet "complete" since the Member States maintained a safeguard clause, whereby the EC Commission acts at the request of a Member State to determine whether a dangerous situation exists on the labour market in a particular area or branch of industry and consequently can suspend the activities of the Community system for vacancy clearance.

Migrant workers have been moving into big cities and industrial areas of Member States since the establishment of the Community. This phenomenon has resulted in unbalanced development in regional policy and employment policy which are subject matters of the Community. To reduce the differences existing between the various regions and the backwardness of the less favoured regions, is one of the important social objectives of the Community, although migrant workers are able to obtain higher incomes in the host country than that of their home countries.

Although the legislations on free movement of workers are applicable to the EEC-countries, some discrimination exists in relation to migrant workers who have arrived from non-EEC-countries since the establishment of the EEC. These migrants do not always enjoy freedom of movement within the host country, let alone freedom

to bring in their families, to change their jobs, or to join trade unions, although they have played a still more important part since the early sixties. Such problems regarding the improvement of social conditions of workers of non-EEC-countries have been indicated in a proposal called "Social Action Programme" submitted by the EC Commission to the EC Council on October 25, 1973.

As for migration trends in the Community, the regulation concerning the free movement of workers has not provided an added incentive for Community nationals to migrate, and the wage differentials are a stronger incentive to migration than the abolition of formal restrictions amongst Member States.[22] Finally it seems necessary that the worsening situation of the non-Community migrants—, called "Europe's new lower class," be improved as a Community matter.

Annexed Table: Number of Foreign Workers and Proportion of Foreign Workers in the European Community

	Total population (in thousands)	Total working population (in thousands)	All foreign workers and workers of EC-countries (in brackets) (in thousands)	All foreign workers and workers of EC-countries (in brackets) as % of total working population	Annual averages
Belgium	9,700	2,878	220(1) (126.7)	7.6 (4.4)	1972
France	51,500	15,600	1,520(1) (299.0)	9.7 (1.9)	1972
Germany	61,500	22,600	2,350 (577.5)	10.4 (2.2)	1972
Luxembourg	350	100	37.5 (28.3)	37.5(28.3)	1972
Netherlands	13,000	3,800	122(2) (50.2)	3.2 (1.3)	1972
Italy	54,413	12,790	44 (18.0)	0.3 (0.1)	1971
Britain	53,828	23,691	1,665(3) (625.0)	7.0 (2.7)	1971/72
Denmark	4,963	1,865	37 (8.4)	2.0 (0.4)	1971.1
Ireland	3,014	723	2 (1.2)	0.27(0.1)	1972
Total	252,268	84,047	5,997.5(1,761.3)	7.1 (2.0)	

(1)=Estimated
(2)=Excluding Surinams and Dutch Antillian
(3)=Including the Irish
Source: Bundesarbeitsblatt, *Bundesminister für Arbeit und Sozialordnung*, Jg. 24, 1973; EC Statistical Office, "General Statistics" No. 1, 1975; The Statistics and Information Bureau of the Labour Ministry of Japan, "Foreign Labour Situation under Zero Growth," 1975, p. 230.

(22) H. Werner, *Migration and Free Movement of Workers in Western Europe*, International Migration, Vol. XII, No. 4, 1974, p. 325.

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CONTENTS

NO. 21

KOBE UNIVERSITY ECONOMIC REVIEW 21, 1975

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Kobe University, Kobe, Japan

CONTENTS

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Edited by the School of Business Administration,
Kobe University, Kobe, Japan

CONTENTS

KOBE UNIVERSITY LAW REVIEW International Edition No. 10, 1974

Edited by Faculty of Law
Kobe University, Kobe, Japan

CONTENTS

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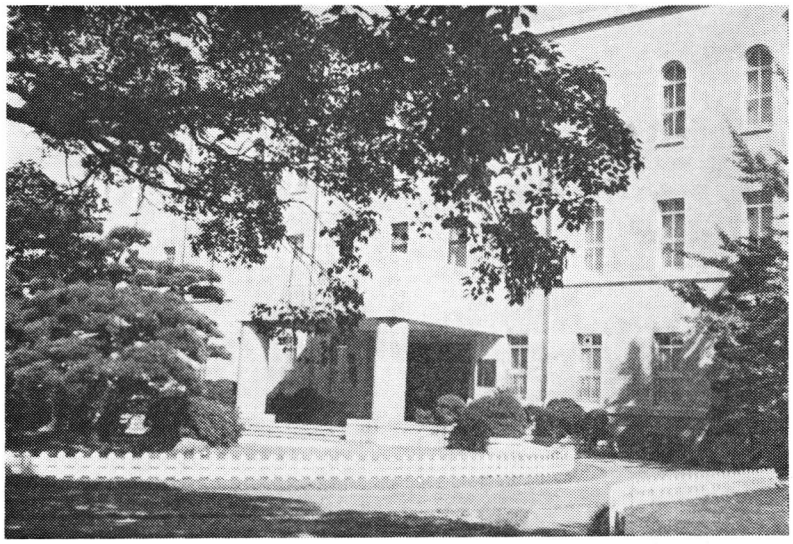

HISTORICAL SKETCH

In 1919, a research organization named the Institute for Commerce was founded in Kobe Higher Commercial School, one of the chief predecessors of Kobe University, with a gift made by F. Kanematsu & Company, a leading mercantile firm in Kobe. The organization was designed to carry on and facilitate integrated research on business and commerce and to formulate and publish the results of these studies and investigations in such form as to make them available to the business community.

With the founding of Kobe University of Commerce, successor of Kobe Higher Commercial School, in 1929, the Institute extended its research activities by adding several divisions. One was the famous Latin-American Library, which soon became the center of research in this field in Japan. A room for statistics equipped with various computing machines was established and began publication of *Jūyō Tōkei Keizai* monthly and *Sekai Bōeki Tōkei* annually. A filing room was prepared to deposit press clipping files systematically arranged by topics and dates. Another room was designed to become the center of all possible original records and data having to do with the beginning and progress of Japanese business.

On the campus of Kobe University of Commerce, another organization named the Institute for Business Mechanization was founded in 1941 utilizing

business machines donated by the IBM Corporation and others. With Professor Yasutaro Hirai as its head a broad and forward-looking plan for business mechanization in Japan was developed.

In 1944, Kobe University of Commerce changed its name to Kobe University of Economics. After the War, however, the University was consolidated with three other colleges in Hyōgo Prefecture to become Kobe University. With this development, the two Institutes were also amalgamated into the Research Institute for Economics and Business Administration, Kobe University. At present, the Institute, with its twenty four full-time professional staff members, carries on studies and investigations in international economy, business administration, and information systems in Japan.

LOCATION AND BUILDINGS

The Research Institute for Economics and Business Administration is located on the campus of Kobe University, Rokko, Kobe. It consists of two three-storied buildings. One is named the Kanematsu Kinenkan and has a floor space of about 2,900 square meters, which includes a president's room, forty-one offices, six rooms used as a library, a room for statistics, etc. Another is built in 1964. It has a floor space of about 1,900 square meters, which is chiefly used as the Documentation Center for Business Analysis, a library and a conference room.

ORGANIZATION

Under the directorship of the president, the Institute operates with two research groups. Each research group and its sections are as follows:

A Group of International Economy

(1) International Trade
(2) International Finance
(3) Maritime Economy
(4) Latin-American Economy
(5) International Law of Economy
(6) International Labour Relations

B Group of Business Administration

(1) International Management
(2) Business Administration and Information Systems
(3) Accounting
(4) Business Statistics

Besides the regular work of the Institute, research committees may be created to carry on any special work requiring the joint study of academic and business circles. At present, there are four standing research committees, that is, Experts Group on Structural Change in World Economy, Committee of International Finance, Committee of Information Systems and Research Group for the Domestic Water Transportation.

For convenience and greater efficiency in carrying out its research activities, the Institute has a general office which is responsible for 1) the collection and preservation of a comprehensive collection of books, periodicals, pamphlets, and original records and data of finance, trade, commerce, industry and business generally; 2) the classification, cataloguing, indexing, arranging, annotation and compilation of these research materials; and 3) the formulation and publication of the results of the investigations and studies accomplished by the professional staff members of the Institute.

As an affiliated institute, the Documentation Center for Business Analysis has been established in 1964. It is the first systematic information facility in the field of business administration in Japan that has been recognized and authorized by the Ministry of Education. The purpose is to collect and to make intensive control of all kinds of materials on business administration and to make them available to scholars, universities, governments, and business world with the aid of modern documentation techniques.