REGULATORY REFORM AND CHANGES IN THE JAPANESE TRUCKING INDUSTRY

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1 Introduction

The trucking industry is one of the rare cases in Japan in which regulatory changes were brought about by new legislation. In 1989, the Japanese Diet passed two bills that relax the requirements for new entry and conditions of fare setting in the industry. In a sense, this was an epoch-making event, because the change was accomplished without any “foreign pressure.” It is true that we experienced big institutional and regulatory changes in telecommunication and railway industries, but in these fields, changes were accompanied by privatization of public corporations. On the other hand, in trucking industry, in which there large number of carriers and almost all are private except for very small companies owned by local authorities, the purpose of the new laws was only to relax the economic regulations.

It should be noted, however, that new enactment does not always lead to a substantial change in administrative policy. In the trucking industry, economic regulations was not as tight as in other transport fields. For example, it was much more difficult for a newcomer to enter into bus or taxi service than in the trucking industry. Thus we can say that the results of the new laws were nothing more than the ratification of the existing state of affairs before the statutory change in the market.

Needless to say, this does not mean that there was sufficient competition in the trucking industry. Many researchers and shippers insisted that there should have been and should be much more competition in the market. The recent report of the Ministry of International Trade and Industry pointed out that the high cost of freight transport including trucking caused by lack of sufficient competition is one element that is reducing the international competitiveness of Japanese manufacturing industry. And indeed, it was the political pressure from industrial consignors that lead to the new legislation.

Judging from some statistical surveys, we could not find clear evidence that the new laws made substantial impact on the trucking market, although we cannot obtain enough data. This means that there is likely to be much room for further regulatory change or deregulation, we also need to show how competition works in this market, and how we can develop it.

In this paper, we examine the contents and processes of regulatory changes in the trucking industry, try to evaluate the effects of the regulatory reform, and discuss necessary change in policy. In the next section, we describe briefly the transport markets in Japan. We the investigate and inspect the legal changes in the succeeding section. In Section 4, we
examine changes in the industrial organization of trucking markets and we also try to measure the welfare changes in case competition would drive fares down. Section 5 evaluates these policy changes. The last section contains our concluding remarks.

2 Transport Markets in Japan

In order to understand trends of transport in Japan we first of all examine overall transport markets. Figures 1 and 2 show changes of shares by mode from 1950 to 1991 for passenger and freight transport. In these figures shares are calculated on passenger kilometers and ton kilometers respectively. Note that Figures 1 and 2 are only for domestic traffic.

For passenger transport, in 1991 about 50 percent of total passenger travels were made by private passenger cars, while the share of railways was about 35 percent. In Japan, railways consist of Japan Railway Companies (JR) and other private and municipal companies. The total number of railway companies is 184. This seems to be the biggest number of railway company in the world. JR were established by division and privatization of Japanese National Railways (JNR), and consist of six passenger railway companies and one freight railway company. Of the remaining 15 percent, bus and taxi services occupy about 10 percent, the remaining 5 percent is by air transport. If we sum up shares of private passenger cars and of bus and taxi services as a category of road passenger transport, two-thirds of total trips were made by road passenger transport.

Modal splits of passenger transport changed greatly in these 40 years. In 1950, just after World War II, the share of railways was extremely large (as much as 90 percent), and dominancy of railways lasted until the mid-1960s. In 1965, railways’ share (sum of JNR and other railways) counted for 67 percent, which is same as recent share of the road passenger transports. After that, the railways continually lost share. In 1970, the share was about 45 percent, ant it dropped below 40 percent in 1980. Recently, it stays around 35 percent.

The main reason why railways lost their share during 1960s and 70s is that passenger car transport grew very rapidly in this period. In 1965, the total number of motor vehicles owned in Japan, including trucks, busses as well as passenger cars, was about 8.12 million. During the next ten years, this number increased to 29.14 million (average growth rate was 13.6 percent!!). Especially, the number of private passenger cars owned increased dramatically. In 1965, the number of cars was two-thirds that of trucks, but ten years later,
the number of passenger cars doubled that of trucks. Thus these ten years are called “the era of private passenger cars” in Japan.

We can see the same tendency in changes of freight transport. In freight transport, the share of railways was more than 50 percent in 1955. That figure dropped to around 30 percent in 1965; railways lost 13 percentage points from 1965 to 75. This means that we could find the turning point of the typical pattern in freight transport during these years. In recent years, the privatized JR Cargo company has been struggling to extend its share, and as a result, the share is relatively stable.

In 1991, about an half of freight was transported by trucks (sum of operating carriers and private trucks), while about 45 percent was by coastal shipping. The share of railways was only 5 percent. As we can see from Figure 2, the share of coastal shipping remained stable in these forty years, and the truck extended its share by depriving railways of traffic. Since freights for coastal shipping are limited to bulky and heavy cargo, competition occurred between railways and trucking.

3 The Evolution of Regulatory Policy on Trucking Industry.

As noted in the previous section, since 1970 the trucking has become the major transport mode in Japan. In the first stage, faced with the rapidly growing trucking business, the government tried to coordinate between trucks and the railways, because the deficits of JNR were steadily increasing. It was the regulation on the trucking industry that the government intended to make use of as a measure of this coordination. The government, however, did not succeeded in this coordination. The railway lost its business, while the trucking industry became bigger and bigger.

Although transport markets differ country by country, the story was same in many major countries. First a competition occurred between railway and trucking. The government introduced economic regulation on the trucking industry in order to calm the competition, but the government failed in this attempt. Next, the regulation on the trucking industry became an obstacle to efficient transport, followed by a surge of deregulation movements. We will look at these processes in Japan in this section.

3.1 Before the statutory change

The trucking industry in Japan had been regulated by the Road Transport Law until
the end of 1990, when the new laws covering freight transport came into effect. The purpose of the new laws was to relax the trucking regulation. This was not complete deregulation, especially compared with events that had occurred in the United States and other advanced countries, but it is true that the new laws are regarded as big regulatory policy changes by Japanese policy standards. We will examine this policy change in detail later.

Since the first version of the Road Transport Law was enacted in 1951, when Japan was under occupation by the Allied Forces, the content of that law was influenced by the regulatory system of the United States. The law adapted a decentralized regulatory system. For example, it provided that the regulatory decision-making process should have been done by the Regulatory Commissions that were established region by region. This system, however, did not get acclimated to Japanese decision-making style, because the Japanese government attaches much importance on the nation-wide uniformity of the policy.

The Road Transport Law was revised in 1953. The revision of that time was so comprehensive that it is not an exaggeration to say that a completely new law was legislated. The new version of the law provided the license system of new entries and approval system of fares, and this authority was basically in the hand of the Minister of Transport (the MoT hereafter). The revision of the Road Transport Law in 1953 centralized the decision-making authority, and the regulation of road transport was carried out based on this version until the end of 1990, although some minor revisions were made during that period.

One characteristic of the Road Transport Law was that it dealt with all modes of road transports. In other words, passenger road transports such as bus and taxi services and freight road transport were all regulated under one legislature. In this situation, it was quite natural that the regulator, the MoT, could use a great deal of administrative discretion in carrying out the regulation, because it is impossible to administer several transport services on the same standards. Wide administrative discretion means that authority and power are much more centralized than the statutory expression of that law.

Generally speaking, freight transports are in the situation that economic regulation is

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1 The foundation law of the MoT requires the Minister to pose a question to the Consultative Council of Transport, which consists of neutral members. But we can say that almost all powers are in the brace of the central government.
likely to be more lenient than passenger transports. This is because social regulations, and in particular safety considerations, are not really stressed in freight transport. If economic and social regulations could be distinguished clearly and administered separately, the possibilities of deregulation of both services would not differ so much, nor would it depend only on the market structure of each industry. In many cases, however, especially in Japan, these two kinds of regulations are administered as a whole; it seems to be true that the regulators or politicians are more reluctant in promoting competition in passenger transport than freight transport.

Reflecting these facts, regulations on the trucking industry under the Road Transport Law were much more relaxed than the regulations for passenger transport. For example, with respect to fare regulation, the MoT permitted only deterministic fare level in the case of passenger transports, while the tariffs for trucking were free to be set as much as its level permitted; it was this tariff band that the MoT permitted for freight transport. For new entry, it was much more difficult to enter markets of bus or taxi services than freight transport. The Road Transport Law provided that new entries could be licensed only if the balance of supply and demand in that market would not be disturbed by those entries. In the bus and taxi markets, the MoT itself judged the proper supply level (and this system remains today), while in the trucking industry, it was possible for a new operator to enter into that market if it could prove that there was a demand for their services.\(^2\)

The regulation under the Road Transport Law distinguished trucking services into five categories: General Line-haul Trucking Business, General Aerial Trucking Business, Contract Trucking Business, Free Trucking Business and Small Vehicle Freight Transport Business. The regulator then issued operating licenses separately (see the left side of Figure 3). Of the five categories, the first two trucking services carried the majority of freight for trucks. Thus, we will hereafter focus on those two businesses.

In the aerial business or aerial operation, a consignor hires trucks; an operator can

\(^2\) Clearly, it is difficult for new entrants to show that there is enough demand for their services in the market. In many cases, those who wished to enter the market first began to operate without a license, and they used these actual business results as an evidence that there was enough demand for license application. Usually the regulator adopted this evidence in judging whether the application should have been admitted or not; in many cases, the applicants were licensed. But, of course these operations were illegal, so the regulator put some penalties on new entrants at the beginning of their legal operation.
carry only one consignor’s freight in one truck. The regulator sets operating areas and issues licenses for each area. Operators with an aerial license could carry goods if and only if the origin and/or destination of the goods was located in the area for which the licenses were granted. The aerial operation resembles Truck Load services in the United States. Almost all trucking companies were categorized into aerial operators, and most of these carriers were small enterprises.

Another main category of trucking service was the line-haul operation. In this operation, a carrier provided scheduled service in licensed routes. This service resembles freight railway service, in that freight is transported from one terminal to another. It is easy to understand that their service needs some feeder and distribution services between consignors and terminal. Operators could consolidate goods collected from various shippers, carry them on a line-haul and then distribute or deliver to consignees. In this service, truck terminals were needed to assort and transship the freight, and the service was a systematic one. As a result, the line-haul operators were relatively large and fewer than the aerial operators. Some researchers insist that there could be economies of scale in the line-haul trucking operation. Almost all line-haul operators also had aerial licenses.

3.2 Regulatory Change

In December 1989, the Japanese Diet passed two bills that aimed to reform the regulation of the trucking business and forwarders. These laws came into effect just one year later, in December 1990. The names of the new laws are the Motor-truck Transport Business Law and the Freight Forwarding Business Law. The former provides new regulation of the trucking business, and the latter deals with freight forwarders. As noted above, the regulation of trucking had been included in the Road Transport Law, while provisions concerned with forwarders were scattered in several transport business laws such as the Road Transport Law, the Civil Air Transport Law, the Railway Transport Business Law, the Maritime Transport Business Law, et al. In other words, one purpose of the enactment of the Freight Forwarding Business Law was to integrate divorced regulations on several forwarding businesses into one uniform provision. Since trucking services are concerned mainly with the Motor-truck Transport Business Law, we will focus on this law in the following parts of this section.

The most important feature of the Motor-truck Transport Business Law was the relaxation of regulations of entry and price setting; that is, the so-called reform of economic
regulations. As explained above, under the Road Transport Law, no one could begin to operate a trucking business without a license, and the law provides the standard on which the regulator judged whether or not a license should be issued. Of these standards for new licenses, the most important and the most influential standard was the so-called supply-demand balancing clause. This clause said that a new license could be issued if and only if the balance of supply and demand in the market would not be disturbed by the new entry. This is a quantitative control of supply. Many scholars as well as economists criticize this clause: they claim that it cannot work well in principle.

The most serious problem of the supply-demand balancing clause of the Road Transport Law is that it is almost impossible for the regulator to get accurate and sufficient information about the market. Analyzing regulatory policy with imperfect information is the latest subject of economic theory of regulation (for example, see Sappington and Stiglitz [1987]). Such a tendency of research itself shows the difficulty of getting information in the regulatory setting.

In the practical administrative process, the problems of imperfect information are also being given much importance. In the case of privatization in United Kingdom, the government had to create a new regulatory scheme because there had been no explicit regulatory system before privatization. As a result, they established regulatory office and introduced the price-cap scheme in fare setting. The feature of price-cap regulation is that regulators do not necessarily need cost information, at least in principle. So we can say that there is a fundamental understanding that, in this regime, the regulator cannot obtain enough information.3

Even if regulators could attain necessary information, there remain other problems in the supply-demand balancing clause of the Road Transport Law. This clause does not work in the case of declining demand. In this situation, regulators cannot balance supply and demand, because the regulator has no ability to reduce the number of operating licenses. Reductions of truck services occur only if some carriers stop offering their services. Without any application, regulators have no measure to decrease supply. It is true that in the case of declining demand, general economic principles would drive away some trucking companies, and that this is one solution to the problem. However, in many regulated

3 But in practice, regulatory officials use rate of return concepts (or something like that) in deciding the minus X factors.
industries, especially in those that have strict entry regulations, incumbents are very conscious about their vested interests, and never try to decrease their supply or terminate some their services. In many cases, industrial associations play some roles in reducing total supply in Japan. Of course, such conduct is likely to be against the spirit of anti-monopoly laws, but some transport business laws have exemption clauses from anti-monopoly law.\footnote{We assumed a declining demand here. Logically, the same problems exist in the situation of increasing demand. But the possibility that new entries occur in a boom period seems to be much higher than that of decreasing demand in recession. Thus problems in a boom are not so serious, as long as regulators do not intentionally suppress new entry.}

The Motor-truck Transport Business Law requires only permission for the business. There are large differences between permissions in new law and licenses in the old, at least in principle. Some researchers in administrative law in Japan insist that an operating license in transport business laws can be interpreted as a special authorization for public business. According to this interpretation, a public business means a business that should be done exclusively by public bodies or the government itself. So at the conceptual first stage, new entities are prohibited from doing this business. Such a prohibition is likely to be against the provision of the Constitution of Japan which says that everyone has freedom to choose his or her occupation (Article 22). But a scholar advocating the theory of a special authorization for public business insists that there are some areas in which restriction on such freedom should be imposed because of public interest. A special authorization is the conceptual second stage. In this stage, business prohibitions are removed, and private entities with ability and fitness to do the business are authorized. According to this interpretation of licenses, the government has unlimited discretion over the licensed companies.\footnote{For this interpretation of licenses, see Yamaguchi\[1985\]. Mr. Yamaguchi has written many drafts of Japanese transport business laws. Recently there is much opposition against such interpretation, and it is said that a special authorization of public business is out of the mainstream research in administrative law.}

The operational permission of the new law does not give much administrative discretion to regulators. In this case, supply-demand balancing actions are not taken by the regulator. In the first place, supply-demand balancing is closely related to the interpretation of operating license as a special authorization for public business. If we follow this interpretation, licensed firms are doing business on behalf of the government or other type
of governmental bodies, and so the competition between companies is thought to be very curious. On the other hand, operational permission of the firm must be issued if the applicant has ability and fitness to carry out the business, and it is quite natural for them to compete with each other in the market.

One point at issue is that the new law has a safeguard clause for excessive supply. Under this clause, regulators can sustain operational permission, in case supply of truck services is judged to be very excessive. This clause can be very powerful if regulators interpret it in their favor, although the ability of regulators is different from the supply-demand balancing clause of the old Road Transport Law. Under the new law, regulators have only limited administrative direction. It is true that in practice, there is no report that this clause is used to stop new entry, but we should bear in mind that this clause gives the regulator potential power to intervene in the market.

With respect to fares and charges, the new law changed the regulation from an approval system to a filing system. Under the old system, carriers had to apply their fare level and structure to the regulator and obtain approvals for them. As we saw in the previous section, if fares and charges were in the tariff band, the application was approved automatically, but in this case regulators surely have discretion power, at least in principle. The new law reduced such power of regulators, but it should be noticed that the regulator has the authority to refuse filing if he deems that the proposed fares and charges are too high or too low compared with costs.

The Motor-Truck Transport Business Law repealed the distinction between the Aerial Operation and the Consolidate Operation. The main purpose of this is to allow carriers to introduce more flexible operation. Aerial trucks were especially criticized, and experienced impediment regarding back-haul freight and empty miles caused by the regulation. Anyway, the MoT insisted that carriers change their operation so that they may establish the most efficient operation by this regulatory change.

However, precisely speaking, the distinction is not completely erased in the new law. It created a new category of operation called the special consolidate operation. In this category, carriers operates systematic transport service, for example, a door-to-door trucking service that combines correction and delivery service, truck terminal and line haul transport et al. The special consolidate operations include almost all services that were classified into the former line-haul operation, and some scholars are criticizing the creation
of this category as it reduces the effects of the regulatory change.

In sum, the trucking business in Japan underwent a regulatory reform that was accomplished by wholly new legislation. In Japan, there are not so many regulatory reforms that involve legislative change. We can place high value on this change. The reform was directed at introducing more competition, but this deregulation was not complete and the effects of new competition are not clear. We will try to assess these effects in the remainder of this paper.

4 Industrial Organization of the Trucking Market

4.1 Market Structure

4.1.1 Number and size of carriers

There are 42,308 motor-trucking companies in Japan. As we saw in Figure 3, the Motor-Trucking Business Law provides three categories of business: general motor-trucking business, contract trucking business and small vehicle freight transport business. Of these three business categories, small vehicle freight transport has different characteristics from other services; its role in freight transport market is not so large, so we will ignore it in this analysis. Figure 4 shows the structure of the other two business categories: general motor-truck business and contract trucking business. General motor-trucking business is divided into special consolidated trucks, hearses and others. Although hearses were a part of the aerial business under the old Road Transport Law, the regulator had dealt with it separately because of its specialty. In Figure 4, carriers other than special consolidated trucking and hearses are called aerial trucks. Under the Motor-Trucking Business Law, there is no category of aerial truck, but hereafter, we make use of this word out of convenience.6

As shown in Figure 4, about 97 percent of total carriers are general motor-trucking carriers, which are the sum of the aerial, special consolidated and hearses, while contract carriers occupy only 3 percent. Of general motor-trucking carriers, the overwhelming majority (91 percent of the total), is former aerial carriers, and only 290 carriers (less than 1 percent) are categorized in the special consolidated carriers (former line-haul carriers).

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6 In many statistics, “aerial carriers” are still categorized and being used.
Figure 5 shows a comparison of corporate size between special consolidated and aerial carriers. Special consolidated carriers are relatively large, while aerial carriers are small. About 94 percent of aerial carriers have capital stocks totaling less than 30 millions yen. On the other hand, more than half of special consolidate carriers have capital stocks more than 30 millions yen. General standards in Japan provide that firms with capital stocks less than 100 millions yen are categorized as small and medium-sized business. Following this standard, more than 99 percent of aerial carriers are small and medium-sized businesses, while among special consolidated carriers, about 80 percent of firms are regarded as belonging to this category.

4.1.2 Cost structure

Since there are large numbers of carriers and they are very diversified, it is difficult to grasp the average cost structure of the trucking industry. Table 1 shows the cost structure of trucking carrier, which is the result of a survey of the Japan Council of Motor Transport. Following this survey, the unit cost (cost per vehicle kilometer) of special consolidated trucks is more than double that of aerial trucks. Although there seems to be no structural differences between the two services, we can say that the labor costs of the aerial trucks occupies much share of total than the special consolidate trucks. This follows the expectation that special consolidated operations are more capital intensive, because of their systematic operation.

We cannot obtain financial data by each category since the regulatory change were made. Table 2 shows that unit costs measured by yen per vehicle kilometer from fiscal year 1991 to 93. According to this table, unit costs increased year by year, so we cannot find clear evidence that the policy change made downward impact on the commercial trucking cost as a whole.

4.1.3 Trend of demand

The trucking industry has developed its business steadily as a whole. This is a result the of growth of total freight transport with Gross Domestic Products growth and the decline of freight transport of railways. Figure 6 shows that while the rate of increase of total freight transported was less than that of real GDP growth, freights transported by

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7 This standard is set by the Small and Medium Enterprise Agency in Ministry of International Trade and Industry.
commercial trucks grew much more rapidly than GDP.

The rapid increase of traffic volume by commercial motor carriers was the result of several factors. First, they deprived the railways of much freight. As noted in Section 2, railways lost their share dramatically from the late 1960s to early 70s. In Figure 6, we can confirm that the traffic volume of commercial trucks increased very quickly in this period. Note that commercial trucks’ traffic volume decreased after that steep growth. The reason for this slight decline is the first oil crisis which occurred at the end of 1973.8

Second, demand shifted from private truck transport to commercial trucks. This demand shift brought about a sharp traffic increase since 1980. In this period, Japan’s manufacturing industry changed structurally; products also changed from heavy and bulky goods to light and compact goods. At the same time, trucking companies developed several new services that created comparative advantages of commercial trucks over private trucks in handling light and compact freight. Figure 7 shows the change of weights per shipping lot by all transport modes. It is clear that the weight of one cargo unit greatly dropped

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8 As stated in Section 2, there was a severe competition between the rail and the trucking in 1960s and 70s. Faced with this battle, the railway freight operators (especially Japan National Railways) insisted that the competition was unfair because while the rail bore the cost of infrastructure, that is cost of rail trucks, freight terminals and so on, the trucking companies did not pay for their cost for roads. And they claimed that the rail should have had been subsidized some parts of its deficits by the public money in order to have made the competition based on “equal footing.” The objection of trucking companies and the Ministry of Construction (the MoC) which is responsible for the road construction and maintenance was as follows. First, in Japan, there was (and still exists) a special account in the public finance solely for road constructions and the source of this special account came from the fuel tax revenue. Second, expressways were constructed and maintained by a toll financing system (see Yamauchi [1994]). The trucking companies and the MoC insisted that since these facts meant that road users bore the cost of roads as a whole, the competition between the rail and the trucking was not necessarily distorted. Ever since the dispute did not develop, and the road financing system did not changed. It should be noticed that, however, the fact that road users pay their costs as a whole does not mean that the trucking companies bore their costs. Since passenger cars are taxed much heavily than trucks, it is likely that trucking companies are undercharged compared with the costs they impose on the road system. Moreover, if we take into account the external or environmental costs of trucking, the discrepancy between the cost they are charged and that they should be charged grows. This seems to be the most serious problem in the Japanese trucking industry.
between 1980 and 85.\(^9\)

Third, since mid-1970s manufacturing industries in Japan began to require much sophisticated logistic systems to modernize their production process. The commercial carriers could (or were forced to) adjust themselves to supply these high quality services, and they succeeded in expanding their business. A typical such service is the so-called Just in Time (JIT) logistic system. In this system, carriers are required to deliver parts to the right place and on time. In such system, however, some redundant capacities and integrated transport systems are needed. In this respect, commercial carriers were in a favorable position.\(^{10}\)

**4.2 Changes in the Trucking Industrial Structure**

The subject of this subsection is whether or not the regulatory changes in 1990 had substantial effects on the structure, behavior and performance of the trucking industry. For the purpose of this subject, we will investigate the trend of entries into and exits from the industry, fares, and the number of employees.

**4.2.1 Change in market structure**

Figure 8 shows the change rates in numbers of trucking carriers. We cannot find explicit effects, negative or positive, of the change from the figure. Since the enactment of the new laws was in 1990, their effects might come in 91 and after, but, unfortunately, we can obtain only two samples from this period. Furthermore, it is often pointed out that structural changes within an industry take a long time. For example, in the United State, the airline industry was wholly deregulated in 1978, and its market structure has fluctuated every three or four years It has been never stable, even 17 years after the policy change. So it is not appropriate to measure the effects from too few data.

Nevertheless, there are some points to be noted in Figure 8. First, as for aerial carriers, their growth rate seems to have accelerated since 1991. Concretely, the number of carriers increased 986 in 1991 and 1,257 in 92. As we saw in Figure 4, aerial truck companies are overwhelming in the industry (about 91 percent), so the increase of

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\(^9\) These data are based on a five-year survey on net freight movements by the MoT, so we cannot get annual data.

\(^{10}\) Recently such systems as JIT are criticized for its making external diseconomies, especially traffic congestion.
companies in this category means expansion of the industry as a whole. Moreover, since the Japanese economy began to decline in 1991, aerial carriers’ expansion occurred in spite of the economic downturn.\textsuperscript{11} If we admit this, there is possibility that relaxation in regulation might have had some effects on the entry.

Second, on the other hand, the number of special consolidated trucks continued to decrease. Especially, in 1990 it substantially declined and continued to decrease in following years, although the declining rates diminished. As for substantial decline in 1990, there is a possibility that statistical error or rearrangement was responsible. Still it may be possible that relaxation of entry criteria might make the number of companies decrease. Where entries are strictly regulated, once companies exit during a recession, they will face a difficulty to enter the market again during a boom: they may well have incentive to remain there.\textsuperscript{12} However, if they expect the entry criteria to be relaxed, they might go out with relative ease. It is not clear that this argument is suitable for special consolidated trucks, but we cannot deny its possibility. As mentioned in Section 3, there was a difference between aerial operations and long-haul operations in administrative treatment.

The second point mentioned above can be accounted for to some extent by the change in the trucking industry’s structure by firm size. From Figure 9, we can see that the special consolidated carriers have been shifting to larger ones. Especially, in 1990, shares of relatively small carriers dropped distinctively. Thus, in that year, marginal carriers left the market, leading to a decline in the number of carriers in this category. In any case, it should be noted that, on average, special consolidated carriers tend to grow larger and larger, and that this tendency seems to have been triggered by the regulatory policy change. On the other hand, as for aerial trucking companies, we cannot recognize clear tendency for them to grow larger (see Figure 10).

4.2.2 Fare trends

The MoT periodically publishes standard fares for each category. According to the MoT’s fare table, fares raised about 25 percent in nominal terms from 1980 to 90, and did

\textsuperscript{11} In Japan, the level of goods transported is said to be a leading indicator of economic conditions. The aerial carriers’ increase in this period is inconsistent with this economic commonsense.

\textsuperscript{12} This argument is often pointed out in taxi cab regulation in Japan. Actually, even in the latest severe recession, taxi companies never reduced their the number of cabs.
not change in 91 and 92.

However, the MoT's fare table stands only for the provisional level. Since in many cases fares are determined through the negotiation between carriers and consignors, it is very likely that fares are less than the standard or even the lower limit of approved tariff bands mentioned in Section 3. For those reasons, it is better to estimate fare trend by something other than this table.

Figure 9 shows the average fare trend, in which average fares are calculated by dividing the total revenue of the trucking industry as a whole by the total ton-kilometers carried. As are there several categories in the trucking business, this is not the best substitute for practical fares, but we cannot obtain detailed data.

From Figure 9, nominal average fares have a long term tendency to rise gradually, but increase rates from 1980 to 90 were less than the published fares (about 10 percent). Regarding real average fares, we may say that fares are rather stable. Unfortunately, in this case also we could not obtain enough data to evaluate the effects of regulatory change, yet it should be noticed that average fare rose sharply in 1991, notwithstanding the government's intention.

4.2.3 Effects on employment and capital investment

In evaluating a deregulation policy or a pro-competitive industrial policy, it is a crucial question whether or not that policy enhances the employment. Because such policies are likely to cause lay off or cut salaries in a particular firm, workers should be compensated by the enlarged chance to be employed as a whole.

Unfortunately, we cannot also obtain enough data to judge whether or not the regulatory policy changes improved employment conditions. Figure 12 shows that, in the past, the number of employees grew as the industry expanded. Concerning recent years, the number expanded in 1990, the peak year of the latest economic boom, while it slightly decreased in 1991, just after the regulatory change, although the number of firms increased.

In Figure 13, recent trends in capital investments are depicted. Generally, capital investments are likely to be influenced by economic ups and downs, and the trucking industry is no exception. Due to slow business, capital investment of the industry is falling off.

4.3 Effects on Social Welfare
In order to judge whether or not a new policy benefits the society from economic point of view, it is necessary to measure the effects brought about by the policy on social welfare. So many studies were made to evaluate the welfare change by deregulations in trucking industry and other transport fields. In this subsection, we will start with brief survey of these studies, and then we will show hypothetical welfare gains which could be obtained in case competition would drive fares down.

Since the deregulation movement in United State, many economists engaged in assessing the economic effects. For example, Morrison and Winston [1986] found that the deregulation in domestic air transport market in United States in 1978 had “led to a yearly welfare gain to travelers and carriers of roughly 8 billion dollars (in 1977 price) without generating any substantial losses to specific groups in society.” Their paper was a pioneer as well as very sophisticated work. They defined compensation variations (CVs) as consumers’ surplus using a formula developed by Small and Rosen [1981]. CVs are the amount of money travelers could sacrifice following beneficial fare and service quality changes and be as well off after the changes as they were before them. Small and Rosen [1981] showed that CVs can be measured based on the mean (indirect) utility which can be estimated by specifying the probability of travelers’ choosing one mode by multinominal logit functions. Another example of estimating welfare changes by domestic air transport deregulation in United States was Koran [1983]. He estimated classical Marshallian consumer’s and producer’s surplus gain and he concluded that “airline fare deregulation resulted in an increase in consumer’s surplus of between fifteen and twenty dollars per round trip, while leaving airline profits unchanged.” Koran’s contribution in this paper was that he explicitly took into consideration the travel time and delay cost changes in the ordinary demand function in estimating welfare changes.

There are also lots of econometric analysis on the trucking industry including estimation of welfare change by the deregulation policy. A seminal work of this kind was famous Meyer, Peck, Stenason and Zwick [1959], which analyzed the competition in transport industries, especially between the rails and trucks. Another milestone in this field was Friedlaender and Spady [1981], which was, in a sense, a modernized version of Meyer.

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13 Morrison and Winston [1986], p.51.
14 Koran [1983], 188.
and others’ work. They estimated cost functions of rails and trucks in trans-log functional form, analyzed the pricing behaviors of each mode, and proposed how the economic deregulation in the rails and trucks should have been done. In 1980, United States’ Congress legislated the Motor Carrier Act which introduced effective competition into the trucking industry and the Stagger’s Act which took away the almost all restriction on fare setting in the railroad freight transport, so, in effect, Friedlaender and Spady’s analysis was done in the regulated environment.

If an industry are under an economic regulation, it is likely that the regulation bear dead weight loss and bring the economic rent to someone in the market, because the regulators may well behave to maximize their personal utilities or some objectives, as pointed out by Chicago school economists and researchers interested in public choice theory. In such situation, who could be beneficiaries by the regulation is another analytical point. Moore [1978] estimated that about two-third of the economic rent resulting from the motor carrier regulation were belonged to workers in the trucking industry in United States. Kim [1989] found almost the same evidence in the Canadian case.

As for the economic effects of deregulation in the trucking industry, Winston, Corsi, Grimm and Evans [1990] estimated welfare gain from policy change as a part of surface freight deregulation. They adopted the counterfactual approach: they measured affected groups’ economic welfare during 1977 when the deregulation had not come, predicted what their economic welfare would have been had deregulation occurred in that year, and then compared actual welfare with their hypothetical welfare. Especially, with regard to shippers’ welfare, they calculated CVs gain under deregulation, which are the almost same concepts used in Morrison and Winston [1986], and concluded that shippers could have obtained about 11 billion dollars (1977 price and 20 dollars in 1985 price), of which about 8 billion dollars had come from the trucking related deregulation.

Next we consider the Japanese case. Unfortunately, in this case again, there are not sufficient data, so we cannot estimate disaggregate demand functions and cost functions such as used in Winston and others’ work. Here, we will try to calculate only aggregate hypothetical welfare gain of shippers (consumers’ surplus) in case average fare would decrease certain percent.

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15 As for the regulators behavior, see Peltzman [1976] and Keeler [1983], [1984], for example.
We suppose aggregate demand function as follows,

\[ TTKC = f(RAR, RGDP), \]

where,

- **TTKC**: Total Ton-Kilometer Carried,
- **RAR**: Real Average Rates, and
- **RGDP**: Real Gross Domestic Products.

Total ton-kilometer carried data are obtained from the MoT [1995], and real average rates data are total revenue of the trucking industry per total ton-kilometer carried deflated by the consumer price index. Real Gross Domestic Products data are published by the Economic Planning Agency.

We specified the aggregate demand function as log-linear form and estimated it using time series data. Estimating demand function by time series data has some defects because the change in preferences over time might be included in the estimation, even though the income effect factor could be exclude by the real GDP variable. Our main purpose in this estimation, however, is to grasp the reaction of demand to price changes, that is to estimate the price elasticity of demand, so we used time series data. The result of the estimation by ordinary least squared method is as following,

\[
\ln(TTKC) = -11.2315 - 0.18187 \ln(RAR) + 1.588103 \ln(RGDP) \]

\[ R^2 = 0.995867. \]

(-15.0558)  (-2.753)  (44.04908)

Needless to say, the price elasticity of demand is -0.18 which seems to be fairly inelastic.

If the competition in the trucking industry have had worked effectively and forced average price down, how much welfare gain shippers could have obtained? Generally speaking, perfectly competitive markets would lead their prices equal to marginal costs, and the trucking industry might not have substantial economies of scale, so we can properly measure the welfare gain by comparing the actual welfare and hypothetical welfare which would be brought about in case that the price equal to marginal cost. As noted above, however, since there are not sufficient data to estimate the cost function which inform us the marginal cost level, we cannot take this approach. So here, we try to calculate hypothetical welfare changes, supposing that average fare would decrease several percent.

The results of the simulation are shown in Table 3. If the competition had decreased average fare by 3 percent in 1991, shippers could have had about 356 billion yen (1990 yen and 2.5 billion dollars by 1990's exchange rate). Needless to say, the hypothetical welfare
gain increase as the average fare reduction grows. In the case of 5 percent and 10 percent average fare decrease, the welfare gains are 594 billion yen (4.1 billion dollars) and 1,194 billion yen (8.2 billion dollars) respectively.

In our calculation, the magnitude of welfare change depends mainly on the absolute value of price elasticity. As noted above, our demand function is very inelastic to price, and this is one reason why estimated hypothetical welfare gains are small compared with other studies. But it should be kept in mind that the price reduction caused by competition would have potential to improve the economic welfare, although the estimation made here give us nothing more than a hypothetical value.

5 Door-to-door Trucking Service Market

In Japan, a door-to-door or home delivery service was introduced in 1976 by Yamato Transport Co. Ltd. Until that time, trucking companies transported mainly industrial freight, and small parcels from the home were handled by the postal service of the Postal Bureau. A door-to-door service is very convenient to consumers, because Yamato created a system that collects parcels via a telephone call and delivers next day in principle. Yamato’s new service became popular with consumers, and grew rapidly. Several companies entered into the market after Yamato’s success.

Door-to-door service is a network business, so constructing a nation-wide network is an essential factor for steady growth and to compete with the Postal Bureau’s parcel service. Yamato tried to extend its door-to-door service network quickly, but faced some obstacles. The main difficulty was that the MoT, the regulator of the trucking business, did not welcome this new service, mainly because the MoT thought the new service influenced other trucking companies’ operation, although they did not handle much consumer service. In effect, the MoT was very slow in approving the first fare application by Yamato, and retarded Yamato’s network expansion by prolonging the examination process of entry applications. Yamato coped with such hindrance by filing an administrative law suit.

In spite of such difficulty, door-to-door services grew rapidly through the 1980s. Figure 14 shows the change of numbers of parcels handled by door-to-door trucking services and the Postal Bureau’s service. Door-to-door services surpassed the Bureau’s service in 1982, and continued to increase at a very fast pace. The average growth rate of that service between 1981 and 93 was 22.7 percent. During this period, fares increased
only once in 1991, and the long term elasticity of the demand with real GDP was 3.55.\textsuperscript{16}

Note that since the mid-1980s the Postal Bureau also increased their traffic. The competition with door-to-door trucking services forced the Bureau to be more efficient (for example the Bureau shortened delivery time), and to introduce new services, although prices did not decrease. On the other hand, trucking companies developed new services such as refrigerated delivery service, in which parcels are kept refrigerated from origin to destination, and direct delivery service of perishable foods, in which agricultural producers can send products directly to end customers on their demand. By these delivery services, agricultural producers can develop their business without any distribution channel. Judging from these facts, we may say that there were huge potential demands for the parcel delivery service market, and that consumers gained great benefits from Yamato’s innovation of operating system in trucking services and competition between trucking and postal services.

A door-to-door trucking service needs computerized systematic operation and many and large truck terminals for transshipment. With respect to demand side, the wider a company’s network, the more attractive its services. So there is likely to exist economies of scale or economies of network in door-to-door services. Figure 15 shows changes of concentration in the door-to-door trucking service market. Market shares of both the top two and the top four are steadily growing, and in 1990, the top two companies’ share together exceeded 70 percent. Some researchers express their concern about an oligopolistic market structure, but it is likely that the market performance will be kept at a relatively high level as long as the Postal Bureau’s parcel service remains strong competitor to the trucking companies.

The regulatory changes in 1990 did not bring about any practical effect on the door-to-door trucking business. The new law relaxed entry requirements into aerial markets; this

\textsuperscript{16} A regression analysis gives us the following result:

\[ \ln(DTDS) = -39.0915 + 3.552635 \ln(RGDP) \]

\[ R^2 = 0.891609, \]

(8.1806) (9.512328)

where \( DTDS \): number of parcels handled by door-to-door services, and

\( RGDP \): real Gross Domestic Products.

Needless to say, a demand function should include price variable in general and network variable in this case. So I also estimated another function that includes real fare term, but the parameter of the fare term was insignificant by t-statistical test. As for network variable, I could not get suitable data or any proxy.
means that carriers are able to expand their service network more easily than before. However, major companies, especially the big four, established their nation-wide network by around 1990, so the relaxation of entry condition seemed to have only marginal effects on them. Since the network size is expected to be a crucial element for consumers, the relaxation of entry was favorable to carriers other than the big four, but since these companies are operating in rather small niche markets, so the competitive impacts from these carriers to the big four were limited.17

6 Effects and Consequences of the Policy Change

What was the major purpose of the regulatory reform in the Japanese trucking industry? It is worthwhile to notice that introducing or promoting competition in that industry was never the main aim of the reform. Generally speaking, relaxation of entry and pricing induces more competition into the industry, and drives down average prices. As a result, general economic welfare is improved by deregulation. In the case of the Japanese trucking industry, however, the regulators seem to have thought that there had been enough competition among the trucking carriers before the change, or they did not put much importance on market competition. And so, we can say that the main purpose of the statutory change was to confirm the market reality.

Since the Japanese trucking industry is very complicated and diverse, it is not easy to understand where the competition works and where it does not. It seems to be sure that its structure has been changing, especially as special consolidated business carriers tend to expand their corporate size. The regulatory changes promoted this movement. However, it is too early to evaluate the overall effects of the regulatory changes, for we cannot obtain sufficient post-change data. The door-to-door service, which was introduced at the end of the 1970s, is thought to be one example of entrepreneurs innovating service, even under regulatory constraints, and has brought about great benefits to consumers.

17 This means that it seems to be possible to apply the theory of contestable market to the door-to-door trucking market. But of course, in order to verify the effects of a potential entrant to some markets, much more detailed analyses are needed.