

The role of trust in US-Japanese food-grade soybean transactions

by

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*To my parents*

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## **CHAPTER 1**

### **INTRODUCTION**

Food soybean has been one of the most important agricultural products traded between the US and Japan. As it is observed in the following chapter, the US has been the largest exporter of food grade soybeans to Japan.

However, not so many studies on food soybean trade between the US and Japan have been done. Especially, studies on the contractual relationships in the food soybean transactions are very few.

This case study research aims to shed light on the transactional aspects of the food soybean trade between US suppliers and Japanese soybean distributors.

The main focus of this paper is on the risk management for Japanese distributors. The background and the rationales for specific risk management methods will be discussed with the focus on the roles of trust in the food soybean transactions. The discussion is based on the information obtained by individual interviews with Japanese distributors, Japanese soybean food manufacturers, US suppliers, and other business entities in the transaction.

## **CHAPTER 2**

### **THE OVERVIEW OF FOOD SOYBEAN TRADE**

In this chapter, we will first explain the characteristics of the major soybean foods in Japan (section 2-1). Second, we will observe two representative soybean product markets, tofu and natto markets, focusing on how they have developed and how their market structures are changing (section 2-2). We have selected these two representative products in the Identity-Preserved part of the food soybean procurement system.

From the available literature and data, we will observe the changes in the final product markets, how these changes affect the strategies of makers and distributors, and the resulting changes in the food soybean trade. In section 2-3, we will overview food soybean trade between the US and Japan. In that section we will develop a detailed description of the physical distribution channel for food soybeans from the US farmers to the Japanese food makers. In addition, we will describe the roles of the firms operating in the value chain of food soybeans. Information was obtained through personal interviews with people in Japanese and US soy industries. These interviews were used to add depth to the analysis.

The impact of introduction of Identity-Preserved (IP) handling on the food soybean transactions as the industry incorporated it will be mentioned in some parts of this chapter. Although IP handling was not a main focus of this paper, the movement to IP may have some impacts on the food soybean business.

#### **2-1 The characteristics of the major soybean foods and the demand characteristics for tofu/natto soybeans**

Tofu is solidified soymilk. In the production process for tofu, makers soak the soybeans in the water for more than 8 hours, thereby permitting the soybeans to absorb water. Then the soybeans are crushed and boiled in the hot water to obtain soymilk. To solidify the soymilk, a coagulant called “nigari” (magnesium chloride) is added to the soymilk.

Since tofu is made from soymilk and its major ingredient is protein, the protein content of the soybeans is the most important single content factor necessary to get high yields in tofu production. Thus, tofu manufacturers strongly prefer high protein soybeans.

Manufacturers usually prefer uniformly large-seeded soybeans because large-seeded soybeans usually contain higher levels of protein. Manufacturers prefer raw soybeans of uniform size because uniformity of the seed size is important in producing tofu of uniform quality. If the seed size is not uniform, it is difficult to keep the absorption rate of water constant in the soaking process, and as a consequence the quality of tofu may eventually vary widely.

The color of the soybean seed coat is another important concern. Makers prefer uniformly white/yellow colors of soybean seeds for two reasons. The tofu manufacturers sell the hulls of the soybeans remaining after the soybeans have been crushed and the soymilk has been extracted to feed producers and fish meal producers. These buyers prefer uniformly white color hulls rather than black color scattering hulls. Even more importantly, tofu manufacturers are likely to prefer soybeans of uniformly colored skin, mainly because they believe that uniformly colored soybeans are more likely to be high quality. Some makers prefer white (clear) hilum soybeans for the similar reasons stated above, but other makers do not care much, because the color of soybean hilum is generally not a critical factor of tofu quality (Soybean Stable Supply Association, 1994).

There are many popular ways of cooking tofu in Japan. It is popular to eat raw tofu with minced green onions, thin-sliced dried bonito and soysauce. During winter, many Japanese boil tofu in the soup stock and eat it with minced green onions and soysauce. It is also popular to cut tofu into small cubic pieces and put the cubes into miso soup.

Miso is fermented and salted soybean paste. To produce miso, the raw soybeans are steamed, mashed and mixed with a small amount of steamed rice and/or wheat. The mixture is then fermented in the warming storage house after a culture of miso bacteria has been sprayed. Then, the matured fermented soybean paste becomes a moist paste miso. Miso is usually sold in 300-500 gram plastic containers.

Miso is used as a seasoning. The major use of miso is to make miso soup, but there are many other usages. Miso soup is usually served with rice in a breakfast meal. For an example of another usage, miso is put on the sliced mackerel meat and grilled together.

Natto is fermented soybean. A rough sketch of the production process is as follows. First, the soybeans are soaked to permit the soybeans to absorb water. Then they are boiled in

hot water and a culture of natto bacteria is sprayed on the cooked soybeans. The soybeans are then put in the warming storage house for about 8 hours to permit fermentation.

To make good natto, the sugar content of the soybeans is the most important factor. In addition, natto manufacturers usually prefer small-seeded soybeans mainly because Japanese consumers have a preference for small-seeded natto. Many Japanese consumers eat natto by mixing it with steamed rice, and they prefer small-seeded natto since the small-seeded natto matches the size of the rice grain better and creates better texture of the natto-rice mixture. Manufacturers also prefer uniformly-sized soybeans for reasons similar to the ones outlined above for tofu (i.e., uniform absorption) and because of consumer preferences for the more uniform-sized seeds.

Natto manufacturers have more rigid requirements for natto soybean appearance than manufacturers of either tofu or miso. This is because natto retains whole the soybeans structure and appearance in the final product, while the soybeans are crushed and the raw soybean shape is lost in the production process of tofu and miso.

## **2-2 The overview of soybean food markets in Japan**

In this section, we will overview the markets of two soybean food products in Japan. First, whole soybean product markets are simply reviewed, and in the following subsections, we will pick up tofu and natto markets and review the market structures.

### **2-2-1 The overview of food grade soybean markets in Japan**

Japan has been one of the largest importers in the world for several decades, as shown in Table 1. Japan has been importing many of these soybeans from the US as shown in Table 2. Table 2 shows that between 1965 and 1985 the demand for soybeans (for oil, food, and feed) more than doubled. But after 1985, the demand has remained at about the same level-around 5 millions metric tons. The US has been the largest exporter to Japan for these 35 years, while China and Brazil have held a more or less constant share. Canada has increased its share steadily for the past 35 years.

**Table 1.** Import of soybeans, by importing country, metric ton (MT)

	1965	1975	1985	1995	1996	1997	1998	1999	2000
<b>China</b>	161,400	854,437	1,469,882	2,876,026	3,797,324	5,633,439	5,194,626	6,673,142	12,720,810
<b>Netherlands</b>	390,970	1,282,059	2,960,249	5,371,855	4,339,200	4,830,300	5,469,100	4,875,601	5,381,490
<b>Japan</b>	1,847,470	3,333,753	4,909,505	4,813,489	4,870,324	5,056,935	4,751,360	4,884,212	4,829,378
<b>Mexico</b>	2,870	22,039	1,493,793	2,232,453	3,048,040	3,410,864	3,489,399	4,067,280	3,984,886
<b>Germany</b>	1,332,290	3,501,742	2,900,036	2,906,862	2,737,122	3,048,103	3,516,978	4,218,293	3,840,424
<b>Other</b>	2,930,273	7,317,402	12,103,504	15,119,530	14,074,715	17,041,689	16,106,819	17,092,483	17,564,838
<b>World</b>	6,665,273	16,311,432	25,836,969	33,320,215	32,866,725	39,021,330	38,528,282	41,811,011	48,321,826

Source: Food and Agriculture Organization of the United Nations

**Table 2.** Supply origins and demand of soybeans, Japan, 1000 MT

Year	1965	1975	1985	1990	1995	1996	1997	1998	1999	2000(est.)
<b>Supply</b>										
<b>Domestic</b>	240	133	238	272	99	119	148	145	158	
<b>US</b>	1465	3041	4345	3456	4065	3931	3891	3735	3867	
<b>China</b>	376	-	-	284	195	158	166	135	144	
<b>Brazil</b>	-	-	22	857	362	379	559	524	585	
<b>Canada</b>	7	8	-	44	53	75	90	98	163	
<b>Paraguay</b>	-	-	-	-	131	300	300	231	81	
<b>Other</b>	6	293	565	84	60	102	141	126	207	
<b>Total Import</b>	1847	3334	4910	4681	4813	4870	5057	4751	4884	4800
<b>Total Supply (exclude inventory)</b>	2087	3467	5148	4953	4912	4989	5205	4896	5042	
<b>Demand</b>										
<b>Oil</b>	1389	2620	3928	3630	3712	3679	3781	3616	3751	3720
<b>Food</b>	624	836	921	994	974	1038	1019	1046	1017	1020
<b>Feed</b>	-	30	70	95	110	110	110	105	105	100
<b>Total Demand (exclude inventory)</b>	2013	3486	4919	4719	4796	4827	4910	4767	4873	4840

Source: The Ministry of Agriculture, Forestry, and Fishery (2000, [a]).

Demand for soybeans, given in Table 2, indicates that about 75% are used for oil production, 20% are for soybean food production, and 5% are for feed. The soybean demand was calculated as the equivalent amount of soybeans required to produce the amount of consumed final products (oil, food, and feed). Soybean demand has not changed greatly in the past 15 years. It has remained at about 5 million metric tons for the past ten years. Between 1965 and 1985, the demand level had more than doubled. Demand for food soybean

has followed this pattern as well. Though it also increased between 1965 and 1990, it stabilized at around 1 million metric tons after that. This implies that the soybean food market in Japan has already matured.

The amounts of imported soybeans by each type of soybeans are shown in Table 3. Note IOM<sup>1</sup> has begun to decrease after 1997 and while at the same time specific variety soybeans like Vinton<sup>2</sup> have begun to increase dramatically. Canadian and Japanese soybean have also increased since then. This implies that more and more firms have shifted from IOM to specific US variety soybeans, Canadian soybeans, and Japanese soybeans.

**Table 3.** Supply of food soybeans to Japan, by type and origin (Estimation), 1000 MT

	IOM	Beeson	Vinton etc.	Canada	China	Total	Japanese	Food soybean total
1992	827	35	70	23	262	1,217	72	1,289
1993	658	32	90	58	190	1,028	68	1,096
1994	780	30	80	36	208	1,134	40	1,174
1995	847	27	120	58	195	1,247	50	1,297
1996	775	25	130	75	158	1,163	70	1,233
1997	789	20	140	90	166	1,205	60	1,265
1998	730	18	170	98	136	1,152	70	1,222
1999	600	15	200	163	143	1,121	90	1,211
2000	400	13	300	239	139	1,091	120	1,211
2001(Est.)	350	10	400	200	100	1,060	150	1,210

Source: Shokuryo Sangyo Shimbumsha (Food Industry Daily)

Table 4 shows how food soybeans have been used in Japan for the most recent 11 years. Half of food soybeans are used for tofu production, 15% are for miso, 10% are for natto. These three products have been the major soybean products in Japan. Among popular soybean products in Japan only soybean used for natto and soy milk have shown growth in these years.

<sup>1</sup> IOM stands for Indiana, Ohio, and Michigan. In the early era of US-Japan soybean trade in 1950's, food soybeans are not separated from soybeans for oil. At that time, they selected large-grain soybeans from the bulk soybeans and sold them as food soybeans after they imported bulk soybeans into Japan. But in 1960's, they began to separate the soybeans produced in the three states, because the soybeans from the three states had the good attributes, i.e., large-grain and high-protein, and were suitable for producing tofu. IOM soybeans are in most cases shipped by bulk through St. Lawrence River to the east coast, and then are carried down to south through Panama Canal to Japan. See the section 2-2 in which soybean flow from the US to Japan is depicted.

<sup>2</sup> Vinton and Beeson are respectively specific varieties of soybeans popular among tofu makers. Vinton is a large-seeded soybean variety with white hilum. Vinton and Beeson contain relatively high protein and then are good for producing tofu.

**Table 4.** Food soybean consumption, by product, 1000 MT

	Total	Miso	Soysauce	Tofu &		Dried Tofu	Soy Milk	Other
				Fried Tofu	Natto			
1990	992	179	6	485	99	31	4	166
1989	1,010	177	11	490	104	31	4	187
1990	994	172	24	494	107	31	3	203
1991	1,013	171	22	494	108	31	3	137
1992	1,037	176	25	494	108	31	3	159
1993	965	173	23	492	109	31	3	152
1994	978	165	22	493	109	30	3	207
1995	974	162	27	493	110	30	3	182
1996	1,038	167	27	492	115	30	3	205
1997	1,019	165	26	494	122	30	3	176
1998	1,046	162	26	495	128	30	4	205
1999	1,017	163	30	492	127	29	6	180
2000	1,010	163	30	492	122	29	7	167
2001(Est.)	1,020	163	30	493	124	30	7	173

Source: The Ministry of Agriculture, Forestry and Fishery of Japan (2000, [b])

**Table 5.** Price (CIF) range of food soybeans by type,  
yen per 60 kilograms and dollar per bushel, year 1998

Use and Variety	Price Range	
	yen per 60 kg	dollar per bushel
<b>Tofu soybeans</b>		
IOM	3000-	11.34-
US variety	4200-6000	15.88-22.68
Japanese	7000-9000	26.46-34.02
<b>Natto soybeans</b>		
US variety	7200-9000	27.22-34.02
Chinese	3000-	11.34-
Japanese	9000-12000	34.02-45.36
<b>Cooked soybeans</b>		
US variety	6000-7800	22.68-29.48
Japanese	11000-14500	41.58-54.81
<b>Miso soybeans</b>		
US and Canada	3000-	11.34-
Chinese	3000-	11.34-
Japanese	7000-9000	26.46-34.02

Notes: Calculated under the assumption that 1 dollar = 120 yen and 1 bushel = 27.216 kg. The prices for Japanese soybeans do not include government support payment.

Source: Shimizu, T. Original data: Soybean Workshop in 1999, The Ministry of Agriculture, Forestry, and Fishery

Finally, Table 5 shows price ranges of US food soybeans. Natto soybeans are generally more expensive than tofu soybeans. The main reason is that the yield of natto soybeans are generally lower than for other varieties.

### ***Use of tofu and natto markets for study***

The tofu and natto markets were selected as focal points for study. Since the tofu market is the biggest soybean product market and consumes slightly more than 50% of all food soybeans, its market trend has influence on the food soybean trade. Although the miso market is the second largest market, the natto market was selected, because natto needs higher-quality specific trait soybeans than tofu and miso. This permits more interesting comparisons with tofu. Cooked whole soybean requires higher-quality soybeans than either tofu or natto, but the market size is much smaller. Considering these facts, the tofu and natto industries were analyzed as the first step in researching the soybean food system in this paper. However, since the other soybean product markets, that is, miso, cooked soybean, and shoyu (soy-sauce) markets, may have unique and economically interesting issues arising from different market structures, investigation of those markets will be one of the potential directions for the future research.

### **2-2-2 The overview of tofu market<sup>3</sup>**

Kiyono focuses on the recent changes in the tofu market and industry structure in Japan from the perspective of demand-driven changes and how they affect the structure of the tofu market and industry. Kiyono relates those changes to the diversity observed in the strategies pursued by tofu makers. These changes include the decline of small sellers and manufacturers of tofu and the emergence and the prosperity of supermarkets. He reveals that these changes in the retail market for tofu have led tofu makers at other levels in the value chain to seek their own unique strategies.

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<sup>3</sup> This section depends on Kiyono for the many parts.

### *The structure of tofu industry*

The degree of concentration in the tofu industry is relatively low compared to concentration observed in other food industries. This is said to be because tofu is so perishable and soft that it is difficult for manufacturers to ship the product to markets very far from their plants, or to store the products for a long period. These conditions make it tough for manufacturers to expand their market to a broader area or to distribute through a long distribution chains (Kiyono, Saeki). Although large manufacturers have been increasing their share in the market as technological innovations (such as larger production equipment and superior packing technology) make it possible to obtain economies of scale and to ship the products to more distant markets, many small and medium makers still successfully operate in the market. In Table 6, it is observed that local and small tofu manufacturers with less than 3 employees make up about 60% of the total number of tofu manufacturers, although their sales share is only 8%.

Local and small tofu manufacturers are in most cases also small tofu retailers. These small tofu manufacturers daily sell all of the tofu they make each day- usually in the early morning to neighborhood consumers. While such mom and pop shops were the majority in the market until 1960's, their share began to fall off when supermarkets appeared and became the main player in the food retail market.

**Table 6.** The number of tofu makers and the sales by size of firm, year 1998

Number of employees	Number of makers		Sales	
	Number of makers	Share	Sales(1 million yen)	share
less than 3	4,345	59	30,508	8
4 to 9	2,114	29	63,267	16
10 to 19	413	6	43,467	11
20 to 29	241	3	58,581	15
30 to 49	96	1	45,237	11
50 to 99	86	1	72,268	18
100 to 199	23	0	47,973	12
200 to 299	8	0	x	} 8
300 to 499	2	0	x	
<b>Total</b>	<b>7,328</b>	<b>100</b>	<b>394,519</b>	<b>100</b>

Source: The Ministry of Agriculture, Forestry, and Fishery (2000, [a]). Original data: *Industry Statistics*, The Ministry of Economy, Trade, and Industry of Japan

### ***The impact of the emergence of supermarkets on tofu industry***

As supermarkets displaced small retailers, several significant changes occurred in the upstream tofu industry.

First, the supermarkets required stable and mass delivery of uniform-quality products. This motivated the manufacturers to introduce large scale plants and to equip refrigerator cars (Kiyono). As those technological changes settled, some supermarkets began to pull tofu manufacturers into an alliance. These changes resulted in the differentiation among the manufacturers in tofu market. That is, tofu manufacturers split into three more or less distinct groups. The first group consisted of relatively small and local family manufacturers and retailers who mainly produce and sell tofu to neighborhood customers. The second consisted of medium sized manufacturers who mainly sell tofu into local supermarkets. The last is large scale tofu makers who hold strong relationship with the large supermarkets. In Table 6, the makers with less than 3 employees may be categorized as the first group, and the makers with 4 to 19 employees as the second group, and the makers with more than 20 employees as the third group.

Because the total volume in the tofu market has remained constant for a long time, the supermarkets and small retailers struggle to retain a share of the total pie. The position of smaller makers has been more difficult because supermarkets' prices are generally lower than the smaller retailers' prices. The smaller retailers' share has been steadily taken away by supermarkets, and the number of small retailers has declined dramatically.

Second, as a closer relationship between supermarkets and manufacturers developed, supermarkets demanded more concession by manufacturers without compensation. For example, supermarkets require frequent delivery of smaller quantities of tofu from manufacturers without any compensation. This requires the manufacturers to bear more delivery cost without added margin. However, in order to compete with other manufacturers, many manufacturers have accepted the requirement (Kiyono).

These changes in the retail tofu market were also accompanied with another change in tofu industry. Many industry people stated in the interviews that consumer demand for tofu is split into two streams. One is the demand for low-priced tofu and the other is the demand for high-quality tofu. Supermarkets have entered both market segments. Low-priced

tofu is sold at bargain price specials by supermarkets, while high-quality tofu is also regularly carried in the shelves in supermarkets. Small family-owned tofu makers typically have only 1-2 kinds of tofu products. Some of such small makers produce high quality tofu, while other small makers produce low-priced tofu.

### ***The impact of the changes on tofu soybean demand***

Tofu manufacturers in Japan began to depend on North and South American countries for the supply of tofu soybeans when the amount of production of domestically produced and imported Chinese soybeans declined in 1960's. But more recently, Japanese food soybeans began to increase because of government support, and tofu manufacturers began to use more Japanese soybeans, as more Japanese soybeans became available and the prices got lower. Since Japanese soybeans are mainly dealt in by domestic distributors, to procure Japanese soybeans, tofu manufacturers tend to make tighter relationship with distributors than before (Kiyono).

According to the comments obtained in the interviews, Japanese soybeans hold both some advantages and some disadvantages for tofu manufacturers compared to imported soybeans. The advantages of Japanese soybeans are that the quality is so high that tofu makers can produce good tofu, and that tofu produced with Japanese soybeans holds higher added value when promoted as domestic when they are sold to consumers<sup>4</sup>. The disadvantages are ① the quality is not stable year to year ② the quality is not consistent depending on the production area ③ the prices still remain at a relatively high level compared to the imported soybeans. These disadvantages have tended to deter many makers from using Japanese soybeans. However, because of the good climate and government support, production increased dramatically in 2000 as Table 3 shows, which led a price decline. Lower prices have enabled more manufacturers to afford Japanese soybeans. Some soybean-purchase managers in the interviews indicated that the difference between Japanese

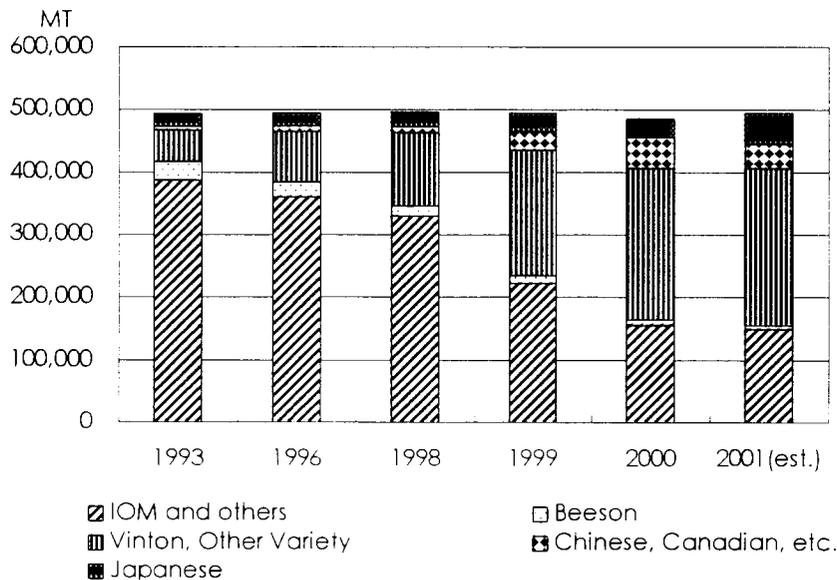
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<sup>4</sup> When makers attempt to differentiate their tofu as high-quality one, they tend to use Japanese soybeans, but not imported soybeans, except organic soybeans. Some interviewees mentioned that US variety soybeans are sometimes better in quality than Japanese soybeans, but tofu produced with US soybeans don't hold added value as tofu with Japanese soybeans do due to consumer preference. This would be a barrier to be overcome for US soybeans.

soybean price and the US variety soybean price has shrunk by 2000 yen per 60 kilograms (approximately 7.9 US dollars per bushel) since 2001. If this trend continues and more Japanese soybeans get into the food soybean market, the demand for US food soybeans is likely to be adversely affected. Despite the recent trend, however, some people interviewed doubted that production of Japanese soybeans would continue to increase steadily in the future.

In spite of the preference for Japanese soybeans, many tofu manufacturers currently have to depend on imported soybeans resulting from the general disadvantages of Japanese soybeans described above. The changes in the industry as Kiyono described in his paper seem to affect the trade of imported soybeans, too.

See Figure 1. This figure shows tofu soybean supply by variety and origin.



**Figure 1.** Supply of soybeans for tofu, MT

Source: Shokuryo Sangyo Shimbumsha (Food Industry Daily)

IOM soybeans dramatically declined for these 10 years, while Vinton and other varieties have increased and displaced IOM as the largest volume category. Most soybean purchase managers for the tofu makers and for the whole raw soybean distributors interviewed stated that more makers and distributors have begun to deal with imported

variety soybeans in recent years. This is especially true after genetically modified (GM or GMO) soybeans were introduced in 1997.

Note that, in general, specific variety soybeans are shipped by containers, while soybeans for oil and IOM soybeans are shipped by bulk in large vessels. Hence, in Figure 1, the increase in the amount of specific variety soybeans implies that container shipments increased and displaced some of the bulk shipment IOM soybeans.

This change has affected the handling procedures in the US soybeans trade in that it required IP handling. Many interviewees indicated that since container shipment is superior to bulk shipment in terms of the reliability of IP handling, many distributors began to use it. But perhaps even more important, the changes in the tofu industry described above motivated tofu makers and soybean distributors to differentiate tofu by using different varieties of soybeans. As a soybean trader employed by a distributor said, “IP handling by itself doesn’t add value any more. We have to import soybeans different from the ones other distributors are dealing with.”

This comment seems to reveal the direction the industry has taken. IP handling alone doesn’t add unique value to soybeans anymore, because established IP handling systems have already been available for all of the distributors. Most of the distributors interviewed believed that all of the food soybeans in Japan are handled in a sound IP system, and that the GM contamination level is kept quite low<sup>5</sup>. Another distributor interviewee said, “In the very early stage of the GM fuss, makers paid premium for IP handling. IP handling was a way for distributors to differentiate themselves. But after several years, it was not any more.” This comment is interesting mainly because it seems that the distributor categorized IP handling only as a way of differentiation. When GM soybeans emerged in the market in 1997, the Japanese government didn’t have any regulation governing GM labeling of the final products. Some of soybean makers used Non-GM soybeans handled separately from GM soybeans in

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<sup>5</sup> The research completed by Shokuhin Sangyo Center (The Center for Food Industry), an research institute supported by the Ministry of Agriculture, Forestry, and Fishery of Japan, concluded that the contamination level should be kept lower than 5% if soybeans are properly handled in an IP handling system. Based on the research, the 5% threshold became an unofficial criterion for IP handling in the industry. But in the actual business, many industry people I met indicated that supermarkets will not accept soybeans if qualitative test shows positive, even if quantitatively, the contamination is less than 5%. This requires strict IP handling for food soybean dealers, and consequently, most food soybean dealers actually achieve quite low contamination level, even less than 1%.

producing soybean foods, and put private Non-GM label of their final products. At that time, IP handling played the role of differentiating the soybeans for distributors, and makers were willingly to pay for the additional cost.

However, just before the Japanese government decided to make GM labeling mandatory (Non-GM labeling was made voluntary) in 2001, many the distributors began to procure soybeans through IP handling system, because they were sure that consumers would never buy soybean products under a GM label. After all the food soybeans had been replaced with Non-GM soybeans, IP handling was no longer a means of differentiating soybean for food uses. As a result, some interviewees stated that makers don't want to pay anything additional for IP handling now. Using IP handling properties, they began to deal with more variety soybeans as we see in Figure 1, while some distributors continue to handle non specific variety Non-GM soybeans in bulk. IP handling can be viewed as the trigger which torched the shift away from IOM soybeans to the specific variety soybeans that allow makers and distributors to better differentiate their products<sup>6</sup>.

### **2-2-3 The overview of natto market<sup>7</sup>**

#### ***The structure of natto industry***

Shimizu, A. focuses on the recent structural changes in natto food system and how natto makers have responded to those changes. In particular, Shimizu, A. focuses on the strategies of natto makers and applies Kotler's categorization of an individual firm's position in the market. According to Shimizu, A., the market structure of the natto market appears to have been created by the oligopolistic structure and prosperity of supermarkets.

The consumption of natto has grown by three fold since 1965. In part the growth occurred because people have come to believe soybean products like natto and tofu are good

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<sup>6</sup> Tachikawa also pointed out that IP handling system, motivated by mandatory GM labeling accelerated the structural changes of grain marketing system. See Tachikawa for detailed explanation of the development of food soybean market in Japan. According to him, the development of food soybean market in Japan holds three phases as follows. ① 1960's: differentiation of food-grade soybean market (IOM soybean) ② 1980's: advent of variety-specific soybean ③ 2000's: containerization of trade and reversal of IOM and variety-specific soybean (Tachikawa, p.4).

<sup>7</sup> This section greatly depends on Shimizu, A.

for their health. In addition, the natto market has expanded to the western part of Japan where natto had not been as popular as in eastern part of Japan (Shimizu, A., Saeki). In households, expenditures on natto purchases have dramatically increased (by as much as 2.5 times in 2000 compared to levels in 1965), while expenditures on tofu has remained at the same level during the period, as shown in Table 7. While the natto consumption has increased for these decades, the number of natto manufacturers has dropped dramatically, and the market has become somewhat more oligopolistic with a large competitive fringe as Tables 8 and 9 show.

**Table 7.** The annual real expenditures of the soybean foods, per person in a household, yen (consumer price index standard: year 1995)

Year	Tofu	Natto	Miso	Soysauce
1965	2242.6 (100)	432.8 (100)	1644.9 (100)	1696.0 (100)
1970	2421.7 (95.2)	469.2 (108.4)	1566.2 (95.2)	1585.5 (93.5)
1975	2336.5 (104.2)	501.5 (115.9)	1380.1 (83.9)	1407.7 (83.0)
1980	2330.3 (103.9)	612.8 (141.6)	1274.4 (77.5)	1226.8 (72.3)
1985	2450.6 (109.3)	704.7 (162.8)	1143.8 (69.5)	1055.2 (62.2)
1990	2369.8 (105.7)	949.6 (219.4)	1029.0 (62.6)	904.3 (53.3)
1995	2228.7 (99.4)	915.8 (211.6)	987.1 (60.0)	871.3 (51.4)
2000	2244.6 (100.1)	1087.7 (251.3)	1016.3 (61.8)	797.6 (47.0)

Source: Shimizu, A. Original source: *The Annual Report on the Household Economy, Annual Report on the Consumer Prices*, The Statistics Bureau and Statistics Center, The Ministry of Public Management, Home Affairs, Posts and Telecommunications of Japan

**Table 8.** The number of approved natto manufacturers

Year	The Number of Firms
1965	1192
1999	720

Source: Shimizu, A. Original source: *Sanitary Administration Activity Report*, The Ministry of Health, Labor and Welfare of Japan

**Table 9.** Natto sales and the share by sales ranking, 100 million yen

Year	Top 1 (Maker T)		Top 2-5		Top 6-10		CR 10		Total
	Sales	Share	Sales	Share	Sales	Share	Sales	Share	
1987	57	10.8	104	19.8	94	18.0	241	46.0	524
1990	107	14.2	161	21.3	161	21.3	399	52.8	755
1995	204	20.4	287	28.7	150	15.0	641	64.2	998
1999	273	23.8	384	33.4	180	15.7	837	72.9	1148

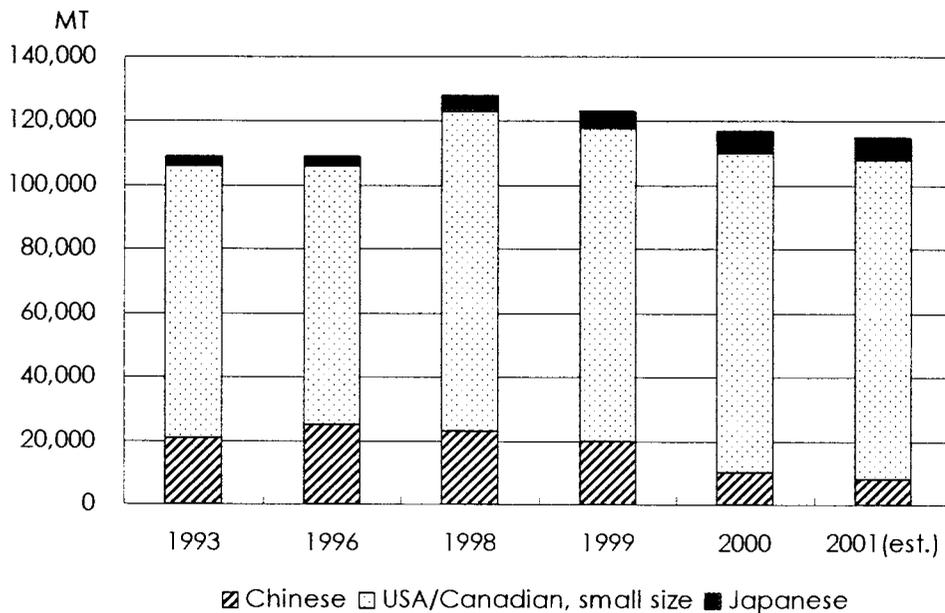
Source: Shimizu, A. Original source: *Production and Sales Share in Alcohol Foods Industry, and Alcohol Foods Statistics Monthly Report*, Daily Economic News Agency

Shimizu, A. identified four factors which might cause the described changes in the market. First, supermarkets have gained power in the Japanese food retail sector. Almost 80% of consumers bought natto in supermarkets in 1999 while the share was only 14% in 1964. Since supermarkets prefer stable and mass delivery of foods, natto makers meet the need to produce a large amount of natto on a continuous basis. This has permitted larger makers to grow steadily while forcing small natto makers out of the market. Second, technological innovation helped makers to become larger. In the 1960's, larger-sized facilities and more efficient refrigerators became popular and some makers began to introduce these new technologies to replace workers at their plants. This allowed natto makers to produce larger quantities of uniform-quality natto. In addition, plastic containers became available to replace more traditional wooden or straw containers. This allowed more efficient storage and transportation of natto products. Hence, these changes have permitted manufacturers to expand their size and to enjoy significant economies of scale. Third, the natto market expanded to the west part of Japan and increased demand for natto. Fourth, larger makers built their plants around the country so that they could increase natto production as the natto market expanded. Since 1989, top makers began to build several plants around the country as the market expanded in broader areas. This has allowed large makers to expand their marketing areas to encompass nationwide distribution for this product.

### ***The impact of the changes on natto soybean demand***

Before the World War II, soybean food makers used Japanese soybeans and soybeans imported from the northern part of China for tofu and natto. After the war, they began to import soybeans for food from the US when the quality of Chinese soybeans

declined. Chinese soybean quality suffered due to the weather and the use of inferior outdated cleaning and screening techniques as well as older outdated equipment. Political uncertainty also motivated soybean dealers to look for suppliers other than China (Tachikawa). At that time, distributors were not looking for soybeans suitable for general use for food, but instead they were seeking specific types of soybeans that were better suited to processing each soybean product. They began to import special variety soybeans and IOM soybeans mainly for tofu, and also began to import special variety soybeans for natto production. Figure 2 shows the supply of natto soybeans by the type and origin.



**Figure 2.** Supply of soybeans for natto, MT

Source: Shokuryo Sangyo Shimbun (Food Industry Daily)

In the natto industry, differentiation has been a key strategy for natto makers, just as it has been in the tofu industry. There seems to be two major approaches to differentiation for natto. One approach to natto differentiation is to use differentiated soybeans with different characteristics as raw material (such as Japanese soybeans and organic soybeans) to produce natto with specific traits. Because climate and insect problems in Japan create production problems, organic soybeans cannot be successfully planted in Japan. Hence organic soybeans

are mostly imported from the US, China, and Canada. The other principal means of differentiation is to develop a different process for making the natto. By employing different production processes, makers can produce natto with different attributes, such as strong flavor, more/less stickiness, and so on. No matter which method natto makers use to differentiate, soybean quality plays a very important role in the production of natto, even when compared to tofu manufacturing.

Unlike tofu and miso soybeans, some natto soybean varieties are very small seeded. Small seed size is considered to be a good property for natto. If the quality of natto soybeans is found to be too poor for natto, in most cases, the only viable alternative market is to sell them to crushing companies. This typically results in a loss since crushers pay a lower price than that paid by natto makers. Unlike natto varieties, tofu soybeans can be still sold to tofu makers at a discounted price, even if the quality is low. It is rare for the quality of tofu soybeans to be so poor that it is not possible to use them to make tofu. Even though poor-quality soybeans sometimes reduce the yield of marketable tofu or may not have characteristics of top quality tofu, there is a place in the market. In addition, the yield of natto soybean is generally much lower than tofu soybeans. Moreover, the quality of natto soybean is more susceptible to relatively small variations in weather and climate conditions. Therefore, it is more risky for soybeans dealers to deal in natto soybeans than tofu soybeans.

Because of these special properties of natto soybeans, most natto soybeans have been produced under production contracts and shipped in containers from the production area. As Tachikawa indicates natto soybeans are procured through closed market channels arranged by Japanese traders and US shippers.

Since natto soybeans have generally been shipped in containers, introduction of IP handling has not affected handling methods much.

### **2-3 The overview of food soybean trade between the U.S. and Japan**

In this section, we will observe a general picture of food soybean trade between the US and Japan. First, the definitions of a distributor and a trading company are established as a basis for the following discussion. A description of how food soybeans are physically shipped from US farms to Japanese soybean food makers and the roles and the

responsibilities of the entities who perform the tasks in each stage of soybean food distribution follows. This description is based on the information obtained through personal interviews with food makers and food soybean distributors.

### **2-3-1 The definitions of a distributor and a trading company**

It is useful to clarify the definitions of a food soybean distributor and a trading company in order to avoid confusion. The term distributor, in this paper, is used to describe a firm in the food soybean supply system that receives the orders from its buyers (either soybean food makers or other distributors), makes the orders to its suppliers (either of exporters or other distributors), and procures the food soybeans for their customers (buyers).

In contrast, a trading company is used to describe “Sogo-shosha” (or an all-round trading company in Japanese), a unique type of business organization seen in Japan and South Korea. Japanese trading companies do not deal primarily in one specific product or product group, but rather deal in many diverse products. A typical leading trading company deals in almost anything, including textile goods, industrial goods, raw materials (including agricultural products and mineral resources) among other products. There are 9 trading companies in Japan.

We use “a first distributor” to refer to a company that imports food soybeans but one that is not among the leading trading companies (sogo-shosha). First distributors may deal in diverse products, but the size and scope of their business is actually smaller and the diversity of the products handled is less than one would observe in the trading companies. The second distributors generally buy food soybeans from the trading companies and/or the first distributors and deliver the soybeans to local soybean food makers. According to Mr. Takizawa, a CEO of Food Industry News, there are approximately 20 first distributors and 70-80 second distributors in Japan.

### **2-3-2 The physical distribution of food soybeans-from US farms to Japanese soybean food makers**

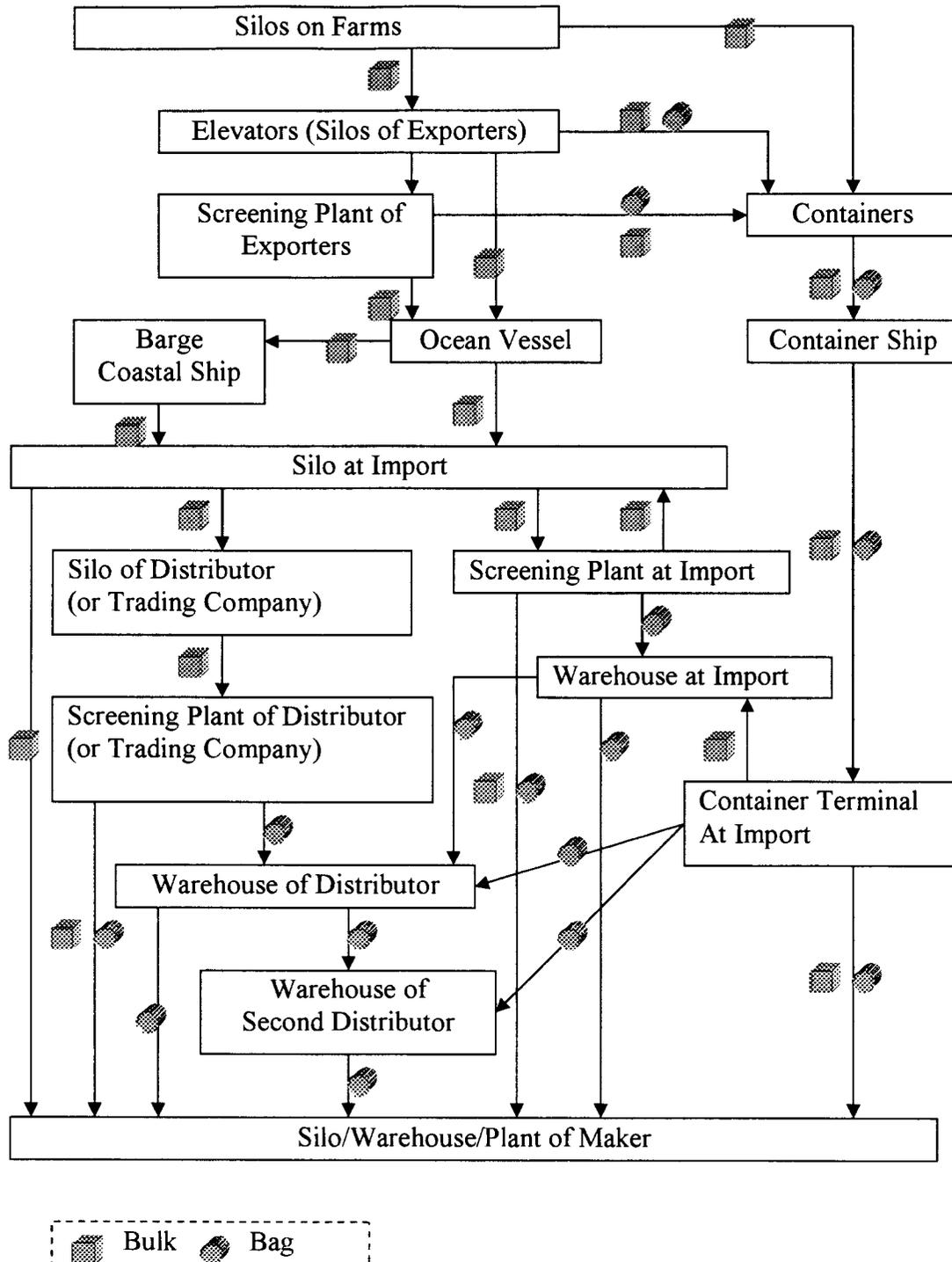
There are well-established routes of physical distribution for food soybeans moving from the US to Japan. Figure 3 shows the routes actually used in the current US-Japan food soybean trade.

There are two principal ways to ship food grade soybeans. One is large-volume bulk shipment, and the other is shipment in 20-40 metric-tons containers. Soybeans shipped in containers may be either bagged or bulk. Large-volume bulk shipment is used when the quantity of food soybean is large enough to use a segment of or all of the cargo hold on a bulk ocean ship. There are several types of bulk ocean ship, but the most popular type can carry 40,000 metric tons of soybeans. These 40,000 metric-ton ships can be compartmentalized into holds capable of hauling 8,000 metric tons. The large quantity required to fill the vessel cannot be financed by all trading companies and only the large trading companies have the capability to charter the ship in most cases. According to one trading company interviewee, there are only four trading companies which can currently charter bulk ocean vessels for themselves<sup>8</sup>.

One of the typical routes for large-volume bulk shipment is as follows. First, farmers ship the soybeans to a nearby country or river terminal elevator. Then, the soybeans are shipped by truck, rail, or barge to the export elevator where the soybeans are loaded onto the bulk ocean vessel. Bulk shipment is particularly useful for shipping the soybeans for oil and other industrial uses. However, IOM food soybeans have generally been shipped in this way. The soybeans go through many transit points where commingling may occur in bulk transportation. Adoption of IP handling has been a challenge for such a bulk system. Some IP shipments have been made using bulk methods, but the work of keeping soybeans separate in a system has required a great deal of extra effort.

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<sup>8</sup> They are Mitsubishi Corporation, Mitsui Corporation, Itochu, and Marubeni.



**Figure 3.** The physical distribution of the US food soybeans

Source: Modified the chart in Shokuhin Sangyo Center (Center for Food Industry), p.59, to include US portions of the distribution system based on personal interviews and other domestic routes.

Container shipment has become more popular in recent years, especially after IP handling has been more preferred in the food soybean market. As more makers and distributors shifted from IOM soybeans to specific-variety soybeans, containerized shipment has increased. Usually, 20 foot-long containers are used for a food soybean shipment. A 20 foot-long container carries a little bit less than 20 metric tons of soybeans. In most cases, the soybeans are screened and bagged before they are loaded into the containers. In other cases the soybeans are loaded in bulk. IP handling is generally more reliable when container shipment is used, because there is an only small risk of contamination with GM soybeans or other “off-types” beans once the soybeans are loaded and sealed in the container.

As shown in Figure 3, the routes for the distribution of food soybeans are quite diverse and complicated. These food soybeans in the bulk shipment system are especially difficult to track since they go through many facilities and the fact makes it very difficult for researchers to obtain the accurate data of quantities and varieties of soybeans shipped via each route. However, according to the distributors interviewed, the most popular route for bulk shipment is farms → elevators → ocean vessel → silos at the import → screening plant at the import → warehouse at the import → warehouse of the first distributor (or the trading company) → (warehouse of the second distributor) → makers. The most popular route of container shipment is farms → screening plant of exporters → containers → container ship → container terminal at import → warehouse of the first distributor (or the trading company) → (warehouse of second distributor) → makers. Note that in the containerized bag shipment the integrity of the shipment is established at the screening plant and there is no exposure to other product prior to receipt by end users.

### **2-3-3 The players and their roles in the food soybean trade**

As indicated above, there are diverse routes in the food soybean distribution. These diverse routes come with many patterns of the combinations of the players/agents, and hence many patterns of the allocations of responsibility. These alternatives are discussed for the typical cases of bulk and container shipment below.

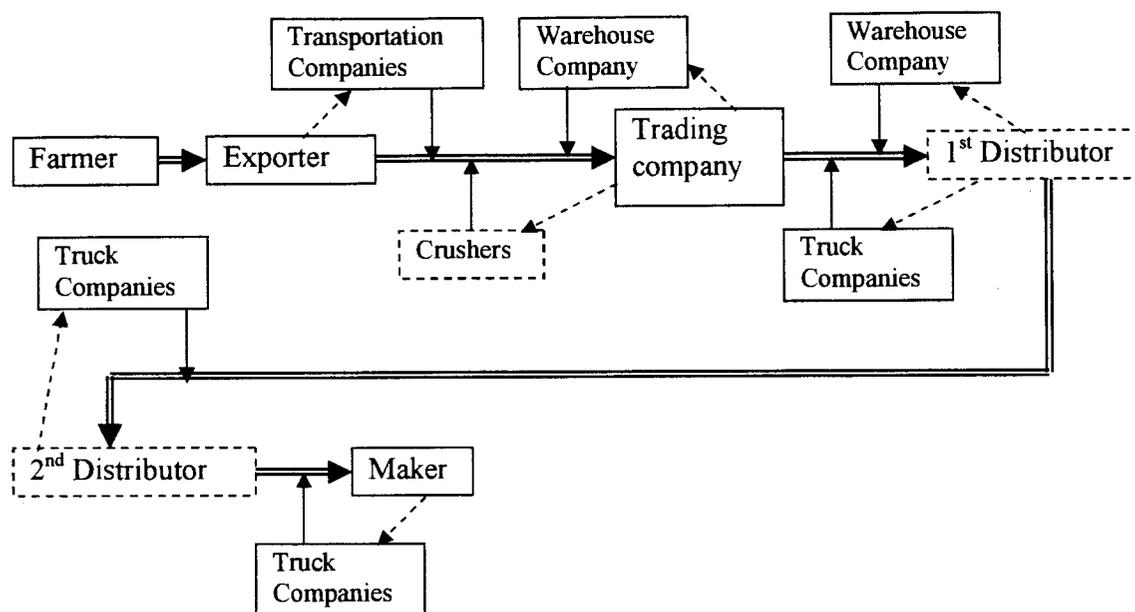
### ***The case of bulk shipment (IOM soybeans)***

Figure 4 shows the typical contractual relationship among the players in the IOM soybean supply chain.

First, in the typical bulk shipment, trading companies usually buy the IOM soybeans from the US exporters. This is necessary because most Japanese trading companies don't own their elevators around Indiana, Ohio, and Michigan. While some companies have invested money in the exporters, this is typically not the case. Japanese trading companies usually estimate the quantity of IOM soybeans their customers will demand for the coming crop year as a first step.

This is done through the meetings with the customer makers held some times between November and March to permit them to make contracts with the exporters before farmers begin to plant. The level of premium, the quantity of soybeans to be purchased, and the types of contract provision such as FOB (freight on board) and CIF (cost, insurance and freight) are established in these meetings. The exporters can then show farmers how much premium they are going to pay before the farmers begin to plant seed. Once the crop is planted, the next step occurs at harvest when they collect the food soybeans. In the case of IOM soybeans, no varieties are not generally specified (although GM soybeans will typically be rejected). This permits the exporters to blend different varieties of soybeans to improve overall quality and grade.

In general, it is the exporter's responsibility to assemble beans from the producers. The exporter then ships the soybeans to the export elevators and loads the soybeans onto the bulk ocean vessels. Since the IOM soybean exporters are large companies, they contact directly with transportation companies. The ownership of the soybeans then passes from the exporter to the trading company when the soybeans are loaded on the ocean vessels in a FOB contract. In a CIF contract it passes from the exporter to the trading company when the soybeans are unloaded into the silo at the incoming ports. The trading companies sometimes contract with warehouse companies or crushers at the incoming ports to store and screen the soybeans. The warehouse companies and crushers typically own their own warehouses or silos at the incoming ports, and some of them own screening facilities as well.



Notes:

The double solid arrows indicate that the ownership of the food soybeans moves along the direction.

The broken arrows indicate that the player at the beginning point of the arrow hires the player at the ending point of the arrow.

The thin solid arrows indicate that the player takes part in the supply chain at the point.

The players in the broken-lined box are not in some of the food soybean supply chains.

**Figure 4.** The agents in the IOM soybeans supply chain

Source: Constructed based on the interviews with the distributors and makers

The warehouse companies and crushers store, screen (seed size, color, and other appearance of beans), sometimes blend and bag the soybeans, according to the directions issued by the trading company. In most cases, the trading company is simply following the customer's specifications for screening and blending the soybeans.

In this sense, the trading company does not only physically import the food soybeans, but plays a key role as an informational medium between the customer (the second distributors/soybean food makers) and the agent (warehouse company/crusher). Some distributor interviewees stated that crushers have high-performance screening facilities and this is why the distributors sometimes elect to use the crusher's facilities (according to Japan Tofu Association, approximately 60% of bulk soybeans are screened by crushers, while the rest is screened by warehouses).

But they also stated that because crushers may have IP handling problems, more distributors have begun to prefer using the facilities owned or controlled by warehouse companies dedicated exclusively to handling Non-GM food grains. After the soybeans are screened, some of them are then shipped in bulk to large makers and to the second distributors, while others are bagged and shipped to the buyers. Large makers and second distributors usually charter trucks to carry the soybeans to their own warehouses and plants.

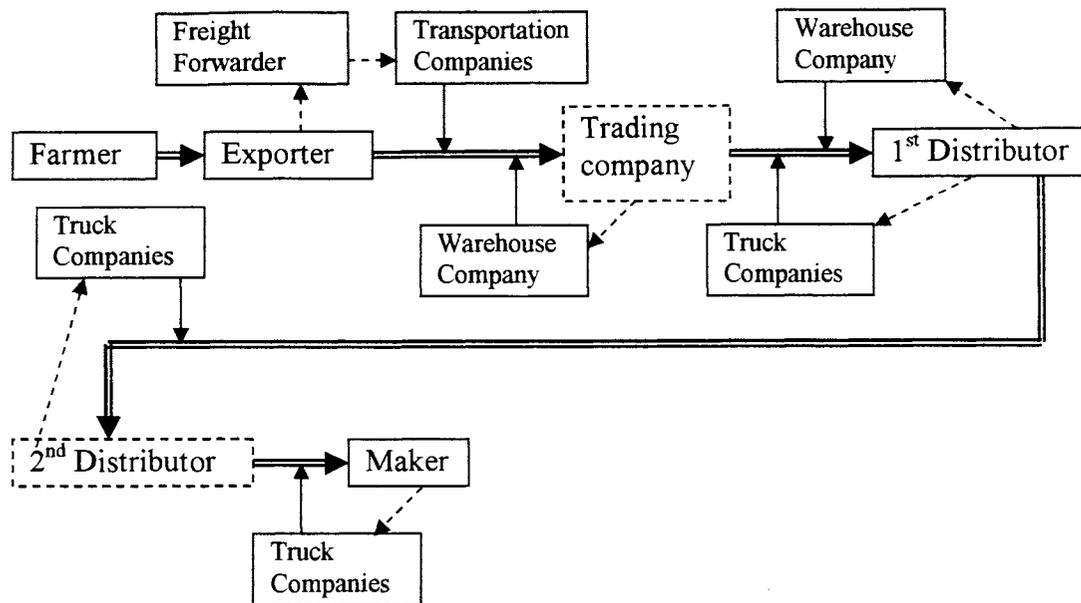
### ***The case of container shipment (Specific variety soybeans)***

Figure 5 shows the typical contractual relationship among the players in the specific variety soybean supply chain.

In the case of container shipment, the Japanese importers are not necessarily trading companies, but in some cases are the first distributors themselves. They contract with the exporters after they estimate the demand for the coming year, typically before March. In the contract they determine the premiums and the area to be planted to each variety of soybeans or quantity of each variety to buy (in most cases, they make area contracts).

The exporters typically make production contracts (area contracts) with farmers after they establish the contract between the Japanese buyers (either of trading companies or first distributors). Some of the exporters also supply the specific varieties of seeds to farmers. At harvest farmers haul their grain to the exporter's storage facility where the exporter screens, bags, and stores the soybeans. The exporter ships the soybeans when the buyer calls for it in most cases.

Depending on the type of contract used, the exporter or the buyer charters containers and the transportation. Usually, they contract with a freight-forwarder to arrange for the chartering vehicles and the actual transportation. A freight-forwarder locates suitable containers and contracts with truck/rail/ocean vessel companies to ship the soybeans on behalf of the exporter or the buyer.



Notes:

The double solid arrows indicate that the ownership of the food soybeans moves along the direction.

The broken arrows indicate that the player at the beginning point of the arrow hires the player at the ending point of the arrow.

The thin solid arrows indicate that the player takes part in the supply chain at the point.

The players in the broken-lined box are not in some of the food soybean supply chains.

**Figure 5.** The players in the specific variety soybeans supply chain

Source: Constructed based on the interviews with the distributors and makers

According to the distributors interviewed, ownership of the soybeans moves from the exporter to the buyer when the exporter loads the soybeans in the container. But in some cases, the ownership of the soybeans moves to the buyer when the buyer receives the container at the import. Freight-forwarders never own the soybeans at any point during the transit.

At the incoming ports, the containers are put in the container yard after they go through the required inspection and through quarantine period, and have cleared customs. These containers are then directly transported to the warehouse of the second distributor or of the soybean food maker. In some cases, the soybeans are carried in the container in bulk rather than in bags. In that case, the soybeans are screened and bagged by a warehouse company before they are shipped to the second distributors and ultimately to the makers. If

the soybeans have been already bagged in the US, they are generally not screened again in Japan. Instead, they are shipped to the second distributors and the makers directly from the import. They use bulk container shipment (soybeans are shipped in bulk by container) when the soybeans are shipped to a large maker.

## **CHAPTER 3**

### **LITERATURE REVIEW**

In this chapter, the basic theories of business organization, transaction, and an agent's behavior are reviewed as an initial step. We will then consider the relationships among firms in the food soybean trade and the management of the supply chain for food soybean. In particular, we will review several papers by O. E. Williamson, J. Hobbs, M. Sako, and J. Rice, respectively. All of them discuss issues related to the functions of the business organizations and the relationships among the independent or dependent business organizations. After the basic literature review, the implications of the papers investigating the roles of trust in business are discussed. These papers include Sako (1995, 1998) and Adams and Goldsmith, in particular. Our analysis in the following chapter will greatly utilize the discussions of the two papers by Sako.

At the end of this chapter, the propositions to be discussed in this paper will be stated. The propositions will be derived from the theoretical predictions based on the literature review.

### **3-1 The theory of transaction cost economics**

#### **3-1-1 Transaction cost economics and related theories**

Coase (1937) mentioned that the existence of transaction costs is the reason that the firms replace market transactions. In another paper, Coase points out that transaction costs in the market transaction arise from several sources.

In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal and on what terms, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on (Coase 1988, p.6).

If the transaction costs in the market transaction are larger than the transaction costs generated by internalizing the transaction within the firm, the transaction tends to be

internalized. In other words, firms replace the functions proceeded by open markets. Coase insists that “a firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm” (Coase 1988, p.44). Coase basically attempts to explain not only the reason for the existence of firms but also the degree of the internalization of the market transactions by firms, from the perspective of minimizing the total costs including transaction costs.

Succeeding and refining the Coase’s insights, Williamson (1987) insists that the transaction costs tend to increase as the degree of specificity of the assets required in the transaction, uncertainty in the transaction increase, and as frequency of the transaction is less. According to Williamson (1987), transaction costs arise because there always exists uncertainty in the transactions and the parties in the transactions are in essence opportunistic. Williamson (1987) classifies the commercial transactions into 6 types, focusing on the frequency and the idiosyncrasy of the transaction as Figure 6 shows. In the figure, Williamson (1987) assumes that transaction costs are in general lower in external procurement than internal procurement because external procurement can avoid bureaucratic hazards. And in the right-lower box in the figure, site-specific transfer of intermediate product across successive stages means that the firm successively procures the materials internally in the production process.

		Investment Characteristics		
		Non-specific	Mixed	Idiosyncratic
Frequency	Occasional	Purchasing standard equipment	Purchasing customized equipment	Constructing a plant
	Recurrent	Purchasing standard material	Purchasing customized material	Site-specific transfer of intermediate product across successive stages

**Figure 6.** Illustrative commercial transactions

Source: Williamson 1987, p.112, Figure 7.1

Figure 7 shows Williamson's classification of the governance structures when a relatively higher degree of uncertainty exists. He argues that non-specific transactions are not affected by increasing uncertainty because the continuity of a transaction doesn't hold significant value since new trading relations are easily arranged. So in the non-specific transactions, market exchange continues even though uncertainty increases. But if the specificity of the transaction increases, uncertainty matters to the governance structure.

In Figure 7, trilateral governance stands for the governance structure when the transaction is for the most part internally coordinated, but is not coordinated as intensively as would be the case in bilateral governance. In the trilateral governance, third-party assistance (arbitration) is sometimes employed to resolve disputes and evaluate the performance of the agent. In bilateral governance, by contrast, "on the one hand, both parties have an incentive to sustain the relationship rather than to permit it to unravel, the object being to avoid the sacrifice of valued transaction-specific economies. On the other hand, each party appropriates a separate profit stream and cannot be expected to accede readily to any proposal to adapt the contract" (Williamson 1987, p.115). Hence, in bilateral governance, the parties have stronger incentive than in the trilateral governance, according to him. This is because the parties commit more specific transactions.

		Investment Characteristics		
		Non-specific	Mixed	Idiosyncratic
Frequency	Occasional	Market governance (Classical contracting)	Trilateral governance (Neoclassical contracting)	
	Recurrent		Bilateral governance (Relational contracting)	Unified governance

**Figure 7.** Matching governance structures with commercial transactions

Source: Williamson 1987, p.117, Figure 7.2

In Figure 7, Williamson insists that as the uncertainty of the transaction increases, the parties will organize trilateral governance if the frequency of transaction is occasional, while they will organize the bilateral governance if the frequency of the transaction is recurrent. Note he claims that once uncertainty arises in the transaction, recurrent transactions will be more highly integrated than occasional transactions. This is because he assumes repeating the transactions which holds higher uncertainty generates higher transaction costs in the external procurement, motivating the parties to integrate the transaction.

A great deal of empirical research has been conducted to see if the Williamson's framework is applicable to individual cases. Palay conducted a case study of rail freight contracting. Palay observes that when the contractor needs idiosyncratic investment in special rail cars to carry their products, the contractor and the rail company tend to engage in higher coordination. Palay relates asset specificity to the following aspects of the governance structures.

First, enforcement concerns how the parties in the contract believe they ultimately would be protected from the other's opportunistic behavior. As the degree of the specificity in the rail cars increases, they emphasize the significance of threat to withdraw any future service or volume, the importance of reputation for the customer companies, and the importance of mutuality of interest. The mutuality of interest comes from maintaining a long-term relationship, preserving a company reputation for fairness, and avoiding any costs occurring from changing systems.

Second, adjustments concern the flexibility of attitudes of parties towards renegotiations. Palay finds that as the degree of asset specificity increases, parties tend to be flexible towards adjustment of the original contracts.

Third, whether parties exchange long-term forecasting and proprietary information with each other is found to depend on the degree of asset specificity. As the specificity increases, they are more likely to exchange such information. Finally, whether parties discuss the future course of transactions is also found to depend on the degree of asset specificity. As the specificity increases, they are more likely to exchange information.

Hobbs (1997) used the survey and the interviews with UK cattle producers to show that transaction costs play an important role for cattle producers in determining the way of

marketing the cattle. There are two ways to market cattle for the producers in the UK. One is the traditional live-ring auction system, and the other is direct sales to packers. Hobbs (1997) divides transaction costs into three main classifications: information, negotiation, and monitoring or enforcement costs. In the survey, producers were asked to evaluate the factors as a numerical value (1 (low) to 5 (high)). And Hobbs (1997) measures the significance of these factors in the producer's choice by using an econometric approach. Hobbs (1997) uses a Tobit model where the dependent variable is the proportion sold through auctions and the independent variables are these factors. As a result, Hobbs (1997) finds that the proportion of cattle sold through auctions is influenced positively by the degree of grade uncertainty surrounding direct sales to packers, and negatively by the risk that cattle may not sell at the auction, the time spent at the auction, the adequacy of packer procurement staff, and so on. Then, overall, Hobbs (1997) concludes that transaction costs significantly influence the producer's decision-making of the way of marketing cattle.

Rice points out that while many economists agree with the point that there exists a third type of coordination mechanism between markets and hierarchies, none have succeeded to make the standard categorization of the third type. Rice calls this third type of coordination mechanism an alliance, then classifies business organizations into 6 types as shown in Figure 8. This figure has been adapted and synthesized by various researchers in an attempt to make the standard categorization. The meanings of the words in Figure 8 follow below.

← Markets		Hierarchies →			
Markets	Alliances (Hybrids)			Hierarchies	
Transactional Relationship	Information Sharing Alliances	Collaborative Operations Alliances (Design, Engineering, Logistics)	Collaborative Network Alliances	Partnerships	Vertical Integration

**Figure 8.** Spectrum of coordination mechanisms

Source: Rice, p.2. Figure 1

The market mechanism and hierarchies in Rice's context accord with the external procurement or the market governance, and the unified governance or the integration in Williamson's context, respectively.

### **Transactional Relationship**

Transactional relationships entail only buy-and-sell activities in a traditional arms-length relationship. Typically, the activities are accomplished in single transactions purchasing products using open market processes to buy products at market prices.

### **Alliance (Hybrids)**

This term is used to describe coordination mechanisms where the parties entail more than buy-and-sell activities, but are not completely integrated.

#### **Information Sharing Alliance**

In this type of alliance, the parties share only passive information such as tracking or inventory visibility.

#### **Collaborative Operations Alliance**

In this type of alliance, the parties share information and the alliance entails active process coordination in one or more domains, such as product design, engineering, and logistics. Sometimes process improvement is planned in the cooperation.

#### **Collaborative Network Alliance**

In this type of alliance, the parties share information and the alliance entails active process coordination. In addition, the parties entails "network-level" financial decisions including mutual investments in joint assets and balancing financial risk with rewards.

### **Partnership**

Partnerships entail some equity ownership. Equity ownership enables the equity owner to coordinate by exercising some control by virtue of owning some of the business. The parties sharing equity interests are no longer completely separate entities, because their goals and objectives are so similar in the partnerships. Subsidiaries and joint ventures are the examples.

Rice argues that as the parties move to the right in Figure 8, the parties in general share increasingly common goals.

Rice's categorization focuses on the two aspects of the transactions. One is information sharing and the other is financial dependency between the parties. Rice mentions that when the transactions need special assets, the parties sometimes share the costs of holding the assets and as a result the financial dependency between the parties increases. In this point, Rice's categorization corresponds to Williamson's categorization. However, it remains unclear how information sharing between the parties relates with the factors (frequency, uncertainty, and asset specialty) which Williamson insists jointly determine the types of the governance structures. Concerning this point, Rice himself states that "it is unclear how successful companies have been developing successful collaborative alliances, nor are the key success factors clearly identified and understood" (Rice, p.6). In other words, it is unclear what factors motivate the parties to share the information and the risk of holding special assets in the transactions.

### **3-1-2 The criticisms to transaction cost economics**

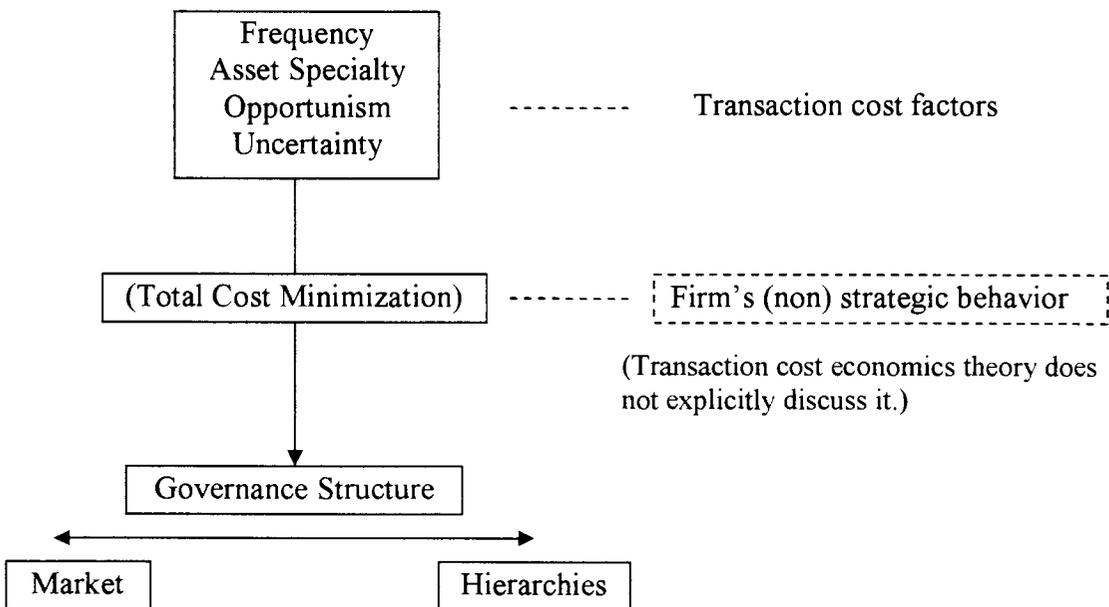
Transaction cost economics is straightforward and intuitive. But as Williamson (1987) himself indicates, it is very difficult to measure transaction costs. Furthermore it is very difficult to predict to what extent and for what reasons a firm will internalize the transactions. Because of the difficulty of numerically measuring transaction costs, researchers cannot in general even make sure that the firm is really minimizing the total cost including the transaction costs. Hence, as Palay and Hobbs (1997) did, the theory of transaction cost economics is practically useful only when it is possible to compare some existing business organizations and institutions and when we can measure the significance of transaction costs, not the numerical values of transaction costs themselves. This fact makes it difficult to directly justify the proposition that transaction costs are important factors which determine the governance structure of the transactions.

Another criticism concerns opportunism, one of the basic assumptions of transaction cost economics. As we see in the following sections, Sako (1995) points out that opportunism is not an important factor at least in some industries. Instead, she argues that developing and maintaining trust is very important in many successful (and then longstanding) relationships.

While Williamson assumes opportunism is one of the causes of transaction costs, Sako (1995) argues that it is not confirmed yet for sure.

Another criticism concerns the relations between the transactions cost factors and the strategic activities actually taken by the parties. Transaction cost theory by Williamson somewhat materialistically explains why agents coordinate in some transactions, as we have reviewed above. There seems to be a gap between actual strategic choices of firms and the more materialistic explanation by transaction cost economics. For more practical application of the theory to the real world, some intermediate framework between the transaction cost economics theory and the behavioral theory of the agents could be useful.

The last two criticisms are on the weak connection between transaction cost theory and actual strategic choice/strategy determination process of the firm. Figure 9 may help reveal the theoretical focus of this paper. First, it should be noted that transaction cost economics essentially claims that the firm will minimize the total costs occurring in the transaction.



(E.g., Rice's categorization of the governance structure)

**Figure 9.** The conceptual framework of transaction cost economics

Figure 9 illustrates the conceptual framework of transaction cost economics. Note that cost minimization is assumed as the firm's activity. This figure indicates that, in the transaction cost economics framework, the firm is in essence considered to pursue cost minimization.

This paper attempts to shed light on the relationships between transaction cost factors and the strategic aspects of the firm (represented as the right hand side arrow in Figure 9) through investigating risk management methods of the firms in the food soybean transaction.

## **3-2 The theory of trust**

### **3-2-1 Why trust?**

Trust is not a governance structure or a transaction cost factor like frequency and asset specialty of the transaction. In the literature, it has been generally agreed to define trust as follows. "Trust is an expectation held by an agent that its trading partner will behave in a mutually acceptable manner" (Sako 1998, p.89). Similarly, Gambetta closes with the next phrase. "[T]here is a degree of convergence in the definition of trust which can be summarized as follows: trust... is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action" (quoted from Williamson 1993, p.463). Here, trust is considered as a perception (maybe intentional strategic or maybe not) of the firm which lies somewhere between the decision of governance structure and transaction cost factors.

We can reasonably imagine that trust could reduce uncertainty in the transactions, for example, by reducing the risk of opportunism. Hence, trust would actually help to determine the governance structure as a result. In short, we can argue that trust is a perception of the firm which could determine the governance structure of the transaction through determining the firm's strategies given a transaction cost circumstance.

Considering this characteristics of trust, we may be able to analyze the relationships between transaction cost/risk factors and the firm's decision process for the governance structure by investigating the roles and development process of trust in the transaction and the sequence observed as the firm's choice of governance structure.

In the interviews with Japanese distributors, some interviewees stated that trust is important to manage risks in the food soybean transaction. And in fact, in the food soybean transaction, longstanding relationships between Japanese distributors and US suppliers with cooperative behaviors such as sharing costs and information on the market trends are quite prevalent. This could be because trust is playing an essential role in the food soybean transaction.

Considering these facts, the food soybean transaction could be a good example for use in investigating the roles of trust in the transaction and to reveal the relationships between transaction cost factors and the firm's strategies. Focusing on the roles of trust, we will be able to observe the firms' active strategic/non-strategic behaviors which may help firms to determine the governance structures given the transaction cost circumstances.

### **3-2-2 Trust in transaction cost economics**

According to Williamson (1993), trust is a subjective probability high enough for a firm to engage in some form of cooperation. Williamson (1993) categorizes trust into the following three types: calculative trust, personal trust, and institutional trust. Williamson (1993) argues that calculative trust refers to a type of trust typically observed in economic activities. Personal trust refers to a nearly non-calculative type of trust characterized by ① the absence of monitoring ② favorable or forgiving predilections, and ③ discreteness. Finally, institutional trust refers to the degree of uncertainty of external environment around transactions. The factors of institutional trust include societal culture, politics, regulation, corporate culture, etc.

Although the definition of calculativeness is not given in Williamson (1993), it is considered as "the general condition that I associate with the economic approach" (Williamson 1993, p.456). In this context, Williamson (1993) seems to imply that calculativeness is one of the characteristics of rational economic agents. Rationality of economic agents is one of the most basic conditions of the economic approach. Rational economic agents are self-interested people who attempt to optimize their economic activities by using all available information. Such people need to be calculative in using information and making decisions in order to optimize their activities. Otherwise, they probably would

not be able to use information to optimize their activities. Then, calculativeness may be defined as a description of an aspect of rationality that economic agents are either rational or bounded-rational and they intend to optimize their activities using all the information available to them.

To be more precise, it may be noteworthy that non-calculativeness is a concept different from bounded rationality. Bounded rationality means that economic agents try to be rational but they simply cannot be so due to the lack of information and/or limited ability of foresight. In comparison, non-calculativeness means that economic agents are not rational or may not even try to be so. Non-calculative activities are sometimes irrelevant to economic activities that economic agents attempt to optimize.

Concerning calculative trust, Williamson (1993) argues that “it is redundant at best and can be misleading to use the term “trust” to describe commercial exchange for which cost-effective safeguards have been devised in support of more efficient exchange” (Williamson 1993, p.463). Williamson (1993) also argues that trust used in commercial exchange is calculated and that trust can be considered as a subset of calculated risk. Thus, in short, his main idea is that since trust in economic activities can be completely considered as (negative) risk factors without loss of essence, introducing the concept of trust in economic analysis is not productive.

However, Williamson (1993) also admits that it is important to discuss the role of other two types of trust in the human society without too strong emphasis on rationality or calculativeness.

### **3-2-3 Trust in game theory**

Game theory is one of the most important analytical tools used in various academic fields including economics. Game theory has been used to analyze interactions of agents involved in economic/political transactions. In the framework of game theory, it is generally assumed that every agent is self-interested, and opportunism as a version of self-interestedness is sometimes assumed either implicitly or explicitly. One of the striking implications often derived from game theoretic analysis is that cooperative behaviors of

agents in transactions can be one of the possible outcomes even if the agents are assumed to be self-interested or opportunistic.

A case in which self-interested agents cooperate with each other is observed when agents play the same game repeatedly in every period (repeated games). Fudenberg and Tirole state that repeated games may be a good approximation of some long-term relationships in economics; particularly those where trust and social pressure are important, such as when informal coordination are used to enforce mutually beneficial trades without legally enforced contracts.

Many repeated game models, however, end up with multi-equilibria including both cooperation and defect outcomes and fail to give a unique equilibrium. To overcome this weakness, the concept of reputation is sometimes used by game theorists. If a player always plays in the same way, his opponent will come to expect him to play that way in the future and will adjust their own play accordingly (Fudenberg and Tirole). Then, the player who holds reputation that he always play in the same way may be able to achieve a desirable equilibrium as long as he can successfully maintain his reputation among his opponents. Using such reputation effects, some authors have attempted to provide a way to pick and choose among the many equilibria of an infinitely repeated game, and they actually show that reputation effects do pick out the unique Pareto-optimal payoffs in games of pure strategies when the prior distribution on the player's types (long-run players or short-run players) is restricted in a particular way (Fudenberg and Tirole).

Game theory can be a useful tool for the analysis of the roles of trust in the food soybean transaction. Although this paper does not utilize game theoretic analysis, future research will need to consider the possibility in order to test hypotheses described at the end of this chapter.

### **3-2-4 Sako's theory of trust**

Sako (1995) criticizes the transaction cost economics approach because it makes a strong assumption of opportunism. Sako (1995) came to believe that trust rather than opportunism plays an important role in the inter-firm relationship, when Sako (1995) conducted interviews with the managers of the parts-suppliers in Japanese auto industry. In

the interviews, no interviewees mentioned to problematic opportunistic behaviors in their relationships, according to Sako (1995).

Sako (1995) has completed a good review of the literature on the roles of trust in transactions.

According to Sako (1995), there have been two groups which hold different views of trust. One is the group which considers trust as a precondition of economic development. This group argues that “trust existed in a state of nature and industrial competitiveness was its outcome” (Sako 1995, p.2). But Sako (1995) points out that trust began to play important roles in Japan only after the Second World War. Sako (1995) criticizes this assertion because it doesn't match the view that trust is a fruit of the culture as the first group insists.

The other group considers trust as an outcome of economic development. This group argues that trust is a by-product of an intensive interaction which is necessary to achieve this end. Game theory has become a powerful tool for the latter group. Axelrod argues that mutual expectation of infinitely repeated encounters is sufficient to motivate the partners to act cooperatively and trust may follow. But Sako (1995) argues that trust is more than cooperative behavior. Moreover, Sako (1995) argues that in a finite time period, cooperation may never take root or may not be sustained even though it has been established.

In short, Sako (1995) argues that both of the views are simplistic, and that the reality probably lies in between the two.

Sako (1995) also criticizes transaction cost hypothesis in the following point; “[u]ltimately, the development and the maintenance of trust relations require a fair amount of resources in frequent communication and information sharing between organizations. It is therefore not necessarily economizing on transaction costs (Sako 1995, pp.3-4)”.

This is an important criticism when we investigate the relationship between transaction cost factors and firms' strategic activities. In this statement Sako (1995) indicates that the possibility that cost minimization by the firm may not always be an appropriate assumption.

Note that all of the criticisms by Sako (1995) concern to the assumptions in transaction cost economics. The assumptions are that the parties are in essential opportunistic, and that the parties choose the governance structure to economize on transaction costs. Sako

(1995) claims that detailed analysis of the roles of trust and the further inquiry of the reasons of existence of trust will be required to test these hypothetical assumptions.

To better define the role of trust, Sako (1995) first classifies trust into three types as follows.

First, “contractual trust” refers to “the mutual expectation that promises made are kept” (Sako 1995, p.4). Contractual trust may be based on a bilateral contract or more universal standard or law. In general, written or oral contracts can be made only if contractual trust is assumed. And in common sense, opportunistic behavior in a broad meaning becomes an issue in the context of whether they hold contractual trust in their relationship or not.

Second, “competence trust” refers to “the mutual expectation that the other party is capable of fulfilling his promises” (Sako 1995, p.5). This type of trust concerns to the technical and managerial skills of a partner. Assets held by a party can also be an important factor for obtaining competence trust.

Finally, “goodwill trust” refers to “the mutual expectation of open commitment to each other” (Sako 1995, p.5). Here, she points out that a commitment is open “whenever an actor is willing to respond to a wide range of requests and to take initiatives whenever opportunities for mutual benefit are found” (Sako 1995, p.5). Contractual trust is the lowest level of trust, while goodwill trust is the highest level of trust.

Sako (1995) argues that the same outcome may be caused by different factors and intentions, and then can be considered as a result of either trustworthy acts or untrustworthy acts of the agents. Hence, it is important for firms to decide in what sense the partner is trustworthy. For example, Sako (1995) cites a failure to achieve an on-time delivery. One possible reason for the delay can be misplaced contractual trust, when the supplier knew they would not be able to be in time before the contract. Another possible reason can be just a lack of fortune, when a machine malfunctions suddenly and unexpectedly. If their customer knew the background of the failure, they could have taken an alternative way of governance to avoid the delay.

According to Sako (1995), these types of trust are expected to be established by different approaches. In addition, Sako (1995) expects that more knowledge and information of the partner firm will be required to establish and maintain higher-level trust.

Finally, Sako (1995) predicts that trust is most useful under conditions of uncertainty and bounded rationality, less so when risk calculations are possible in the conclusion.

Sako (1998) utilizes the same theoretical framework to analyze auto industries. Sako (1998) compares the roles and the development process of trust in the automobile industry in the US, Japan, Germany, Britain, and Latin Catholic European countries using the data obtained from survey to the managers of the supplier companies. Sako (1998) points out that technical assistance to the supplier companies by the customer automobile companies has contributed toward the establishment of higher competence trust in the supplier-customer relationship in the automobile industry in Japan than in other countries. In addition, Sako (1998) verifies that such technical assistance has significant effects on the establishment of goodwill trust in Japan. Another argument is that “a history of good experience with trusting behavior in Japan may have promoted the diffusion of trust” (Sako 1998, p.102). This is also verified to some extent through statistical analysis in Sako (1998). These findings imply that trust is sometimes obtained through the intentional attempts of the firms, but societal environment also affects the possibility of emergence of trust in the business relations.

### **3-2-5 Literature on trust in agricultural economics**

In the fields of agricultural economics and agribusiness studies, some research has been done on the roles of trust in agribusiness.

For example, Sporleder argues that “the role of trust in vertical network alliances is ubiquitous” (Sporleder, p.4). According to him, the roles include cost savings to the firm and enhanced organizational capacities within the firm. Adams and Goldsmith argue that trust-based alliances reduce costs, increase efficiency, and allow flexibility necessary for success in a rapidly changing market place. Adams and Goldsmith argue that trust-based governance structures do exist and can perform quite well at higher levels of specificity and transaction risk.

In addition, Adams and Goldsmith insist that while trust-based governance is not a complete substitute for all forms of traditional governance, “the potential for trust to substitute for a contract and the ability for trust to offset transaction risk is a function of knowledge and predictability” (Adams and Goldsmith, p.241). Then, “by increasing knowledge and familiarity between the transaction partners, trust and its power can be enhanced” (Adams and Goldsmith, p.242).

Sporleder and Adams and Goldsmith are important papers related to the focus of this paper. The two papers, however, do not explicitly discuss the origin and development process of trust using concrete examples. Adams and Goldsmith implicitly adopt the assumption that agents are in essence always self-interested. As a result, Adams and Goldsmith treat trust as a strategy which the firms consciously choose to substitute for more explicit contracts.

Two papers by Morrow, et al. (1999, [a] and [b]) study the role of trust in the activities of a producer-owned marketing cooperative. Morrow, et al. ([a]) classify trust into two types. One is cognitive trust, which is objective in nature and is based on a rational, methodical process that results in the judgment that an individual or organization is trustworthy. The other type of trust is affective trust, which is subjective in nature because it is based on the moods, feelings or emotions that one has concerning the perceived trustworthiness of an individual or organization. Using the data collected from the questionnaires to member farmers, they find that trust in the general meaning (which can be considered as the combination or mixture of cognitive and affective trust in their context) is significantly affective to the management and the performance of the cooperative. Morrow, et al. ([a]) also find that both of cognitive and affective trusts are individually affective on the decision if they can trust the other members or the organization itself (Morrow, et al., [a]).

In another paper, Morrow, et al. ([b]) find that affective trust has a positive effect on non-financial indicators of performance (e.g., fulfillment of expectation and objective), while cognitive trust may have a positive effect on financial performance (e.g., increase in profits and revenue) (Morrow, et al., [b]). Their findings are interesting when seeking to identify the origins of trust. Cognitive trust may be considered to be consistent with “trust as a by-product of an intensive interaction”, and affective trust to be consistent with “trust as a state of nature” described in Sako (1995), respectively. Therefore, the facts that cognitive trust is

positively related to financial performance and that affective trust is positively related to non-financial performance can be considered to indirectly support Sako's perspective that trust can be obtained through both of rational calculation and more ambiguous (and maybe societal or cultural) conditions.

Interestingly, Morrow, et al. ([b]) also find that there is a negative correlation between the degree of opportunism and the level of trust. In the status of low trust, they are more likely to depend on written contracts. However, since they use general trust (mixture of cognitive and affective trust) as an independent variable in their model, it is not clear if the member farmers intentionally choose either of trust or contract in order to minimize opportunism.

The literature on trust in the field of agricultural economics is not plentiful. While some works including what has been introduced above pointed out that trust is an important factor in the determination and the performance of governance structure of agricultural product transactions, it remains unclear what kind of the roles trust actually plays in the transactions.

### **3-3 Proposition set-up**

In this section, five propositions to be argued are stated. The propositions are derived based on the above literature review, and will be examined in the following chapters.

First, as Sako (1995) implies, a trust-based relationship can be most useful when it is extremely difficult for the parties in the transaction to calculate expected costs and benefits under uncertain conditions. Trust-based relationships are usually observed as informal coordination between business entities and are sometimes considered as a substitute for formal coordination methods (Adams and Goldsmith).

Considering these facts, we will set up the first proposition:

(P1) Informal coordination is likely to be used when it is extremely difficult for the parties to calculate expected costs and benefits in the uncertain transactions.

And the second proposition is:

(P2) Trust is a factor for making such informal coordination possible.

Following Sako's categorization of trust, the third proposition is:

(P3) Three types of trust (contractual trust, competence trust, and goodwill trust) exist in the food soybean transaction.

As Adams and Goldsmith and Sako (1995, 1998) suggest, the fourth proposition is:

(P4) Trust reduces transaction risks/costs.

Finally, the development of trust in the food soybean transaction will be investigated. While there seems to be no agreement on the development process of trust among the reviewed literature, the fifth proposition is based on Sako's argument that trust can be established through both calculative and non-calculative process and the observation in Morrow, et al. ([a], [b]). The fifth proposition is:

(P5) Trust is developed through both calculative and non-calculative processes.

## **CHAPTER 4**

### **METHODOLOGY FOR ANALYSIS**

To examine and refine the above propositions, the case study approach will be adapted in this paper.

The case study approach is a useful analysis tool when “how and why” questions are asked and investigated (Yin). The main objective of a case study is often to seek out the answers to these questions on the reasons of an agent’s activity.

The most striking difference between the case study approach and the statistical analysis approach lies in the ways of generalization or justification of a hypothesis. In statistical analysis, statistical/econometric methods are applied to numerical data collected from representative numerous observations to justify/reject a given hypothesis. But in the case study approach, a small number of observations are typically available. With a small number of observations, statistical methods are often not appropriate for use in attempting to generalize/test a hypothesis, but the case study approach can be a powerful method. In essence, case study approach is a method of qualitative rather than quantitative research. It is a useful method to seek out, refine, and examine qualitative (how and why) hypotheses.

Almost no information on the contractual relationships between the parties in the food soybean transactions was readily obtainable at the time this research was carried out. Furthermore, no studies reporting on the contractual relations among grain businesses were available.

Due to the lack of information, two different tasks were pursued simultaneously in this research. The first task was to collect basic information on the food soybean industry situations, alternative value chains, value chain transactions, and how they occur. This basic information was reported in the overview of the industry in the chapter 2 of this paper.

The second task was to identify the key factors which significantly affect the governance structures of the food soybean transactions. Especially, the information about risks and corresponding risk management strategies was crucial, since we were originally interested in the risk management aspects of Japanese distributor’s food soybean transactions.

Conducting these tasks simultaneously was especially difficult given the inherent restrictions and problems in researching multi-national value chains. The main problems encountered are a language problem, the huge geographical scope of the trading activity, the numerous institutions involved, and time constraints. Since most interviews were conducted in Japan, it was practical to visit them only one time for each during a 4-week visit to Japan. Each interview was scheduled to last about 2 hours, although some were less than 1 hour in duration due to the schedules of those interviewed. Visits with some exporters in the US were hampered by a language problem that could not be avoided. These problems tend to limit the quantity and quality of information gathered to some extent. It was also necessary to be very careful not to collect inaccurate or biased information as a result of inadequate pre-information.

To mitigate these problems, at least two people were present at interviews. In the US, Dr. Ginder, my major professor was present at all meetings. In Japan, in most interviews, Dr. Tachikawa, a researcher of MAFF who studies the impact of IP handling in the grain industry was present. By conducting interviews with these partners, it was possible to correct and complement the information collected by comparing notes after the interviews. In addition, complementary questions were asked to the interviewees through follow-up e-mails several times to verify the information obtained in the interviews.

A written protocol of questions to be asked to the interviewees was also prepared. This protocol was designed to collect basic information, and in particular, the information on sources of risks and risk management of the firm in the food soybean transactions. Since it was not expected that many interviewees would mention the roles of trust in the food grade soybean transaction, the written protocol was not in particular designed to ask specific questions about the roles or the development process of trust to the interviewees. The protocol provided interviewees the opportunity to identify important factors in transaction using their own terminology.

But the information about trust is still believed to be useful and consistent when the following fact is considered.

When the interviewees mentioned the roles of trust in the interviews, it almost always occurred when the interviewees were asked what is an important factor for risk management.

This fact provides evidence that the meaning of trust discussed in the interviews does not deviate much from the focus of this paper. Once the term trust was mentioned by an interviewee, it was actually quite natural to ask further questions on the role of trust and the development process of trust in the context of risk management, and there was no prompting of interviewees in most cases. Despite the fact that specific questions about trust were not in the written protocol, it was identified as an important factor.

We will employ an “explanation-building” strategy (Yin, p.110) in this paper. This approach is useful when researchers don’t have clearly established theoretical propositions to explain observations before they collect data in the sample cases. The objective of the explanation-building strategy is in general to establish and refine the hypothetical explanations of observations by comparing the predictions of the hypothesis and actually observed events. Yin mentions the interactive nature of explanation-building approach, pointing out that the final explanation is a result of a series of interactions:

- Making an initial theoretical statement or an initial proposition about policy or social behavior
- Comparing the findings of an initial case against such a statement or proposition
- Revising the statement or proposition
- Comparing other details of the case against the revision
- Again revising the statement or proposition
- Comparing the revision to the facts of a second, third, or more cases
- Repeating this process as many times as is needed (Yin, p.111).

In this method, propositions are compared with observations and tested to determine if the propositions are consistent with the observed facts in each case. After repeating this procedure, the refined propositions will be derived as a result of generalization and theoretical reasoning of the case observations.

The analysis of this paper will basically follow this method to test the consistency of the propositions and to refine the propositions.

As stated above, it was impossible for us to prepare our clearly stated propositions before interviews, since no information on the contractual relationship between the parties in the food soybean transactions was available. Therefore, it is considered to be appropriate for us to apply the explanation building approach to our analysis.

Throughout the analysis, it is our intent to organize the obtained information in a consistent manner along the five propositions. It is expected that this actually will be helpful in revealing what should be discussed in any future research. Therefore, the objective of the analysis is not as much intended to rigorously test the propositions, as it is to refine the propositions by checking the consistency with the actual observations and to build up clearly stated examinable propositions through the process. Some problems with this analysis and the suggestions for future research will be discussed at the end of the analysis.

## CHAPTER 5

### ANALYSIS

In this chapter, we will first describe how individual business parties engage in the food grade soybean transactions. The descriptions are based on the information obtained through the personal interviews. The interviewees include two US food soybean suppliers, one US freight forwarder, eight Japanese food soybean distributors, four industry associations (natto and tofu industries), three tofu makers, two natto makers.

Since the focus of this paper is the risk management procedures used by Japanese distributors in food soybean transactions, the information obtained from Japanese distributors is especially useful. Then, the relationship between Japanese distributors and US suppliers will be described in this paper using the information obtained from Japanese distributors. The information obtained in the individual interviews and described in the section 5-1 will be summarized to illustrate the general characteristics of the food soybean transactions in the section 5-2. Some of the information obtained from other interviewees was used to check the accuracy of the information obtained from the distributors.

In section 5-3, the analysis of the risk management methods employed by Japanese distributors will be given. Risk causes and the correspondent risk management methods will be first categorized and summarized in this analysis. After that, it is argued that trust could be an important factor in risk management by comparing the five propositions and the observations obtained in the interviews.

#### 5-1 Individual case observations

##### *Trading company A (interviewees: the vice director and assistant manager of grain department)*

Trading company A is one of the leading trading companies in Japan. Company A deals with multiple product categories including various foods, minerals, manufacturing machineries, textile goods, and so on. The total 2001 sales of company A was approximately 600 billion dollars (1 dollar = 120 Japanese yens).

The volume of grains (including corn, soybean, wheat and others) handled by company A was about 5 million metric tons or about 18% of the total grain imported into Japan. Company A is the second largest Japanese trading company in the wheat and soybean trades, according to company A's homepage. Two or three merchandisers in the food and oil seed department of company A take responsibility for all the business in the department. It is not unusual, among the trading companies, for the firm to place responsibility on a small number of merchandisers. In many cases, relatively few merchandisers take care of every grain business task in the trading company. Merchandisers travel throughout the world to find suppliers and negotiate with trade partners. There is little seasonality to the merchandizing activities. They are generally quite busy around year in both the northern and the southern hemisphere.

Company A has typically imported food soybeans by way of the bulk shipment system. More recently, it has begun to trade more in specific variety soybeans. These specific variety soybeans are shipped by container transportation system to insure strict IP handling which has become increasingly popular. In the variety soybean transactions, a production contract is usually used with the spot market employed as a balancing mechanism to acquire or dispose of marginal quantities. The spot market currently occupies only 10-20% of the total quantity handled by firms.

Company A deals with 4 to 5 varieties of soybeans for tofu. Company A imports soybeans from Canada, Brazil, the US, and China. Company A trades with 2 to 3 exporting companies in Canada and also trades with 2 or 3 companies in the US to import soybeans, mainly from Michigan and Minnesota. One of the largest grain exporters in the world is among its US trading partners. Its business relationship with the large US trading company is a longstanding one that has continued for several decades.

Company A seeks out and negotiates trades and contracts with the suppliers to import soybeans from abroad. Company A then sells the soybeans into the Japanese domestic market either to distributors or directly to the tofu/natto makers. However, this does not necessarily mean that company A actually handles every individual process of the import directly. In most cases company A subcontracts with other entities more specialized in specific importing and logistics activities including transportation, loading/unloading grains.

The regulatory paper work required to allow the imported soybeans to be admitted to import and be unloaded at the import by officials is also subcontracted in many transactions. The subcontractors then conduct the activities on company A's behalf. Many of the Japanese trading companies and distributors commonly follow a policy of subcontracting out these activities.

The commissioned entities do not generally take title to the soybeans. The trading company typically retains title throughout the transit process. In some cases, the subcontractors have a strong connection with the trading company in terms of financial dependency and long-term business relationships. This further strengthens the ability of the trading company to achieve performance through subcontracting.

An informal contract is usually made between the customer buyers and company A in a period from November to March. They do not usually make written formal contracts at this time. Company A makes orders to the suppliers after they have received informal orders from the customer buyers. The customer buyers typically make their final decision to buy the soybeans only after the soybeans are harvested and after they have actually tested to determine the quality of soybeans.

Price risk can be hedged by using futures markets, according to the manager of company A. Therefore, supply risk (harvested quantity risk) is the most important and difficult to manage. While company A tries to hedge the supply risk by trading with multiple suppliers and corresponding production areas, company A sometimes cannot fulfill the demand due to inadequate quantity. When this occurs, company A attempts to find alternative soybeans, but locating acceptable alternative suppliers is often difficult. As a result, company A cannot always fulfill the demand.

Quality risk is also problematic for company A. Since production contracts between the suppliers and company A generally do not include conditions on the content qualities (e.g., protein content, oil content, etc.), company A has to purchase all the soybeans produced even though the content quality may be lower than desired. Company A then negotiates with the customer buyers to accept the soybeans when content quality is lower, but sometimes the customers refuse to accept the lower content soybeans. In that event, company A must sell

the soybeans to other buyers. These sales are typically made at lower prices than that company A would have received, so company A incurs a loss on the lower-quality soybeans.

Other problems such as delay of the shipment and damage to soybeans can and sometimes do occur in the transaction. When such problems occur, company A attempts to identify the causes for the problem and which party is responsible. If one party is revealed to be responsible for a problem, the cost of the problem will generally be borne by that party. But if the problem is the result of factors beyond the control of either party, both company A and the supplier share the cost. This process is accomplished through negotiations. Such negotiations are informal in nature. Formal contracts do not usually specify what to do in case of a problem.

According to the vice director, it is important to trade with trustworthy suppliers if settlement through negotiation is to be possible and effective. Long-term relationships with the suppliers in the transaction are also quite important in getting acceptable negotiated settlements.

***Trading company B (interviewee: assistant manager of oil seed department)***

Trading company B also deals with multiple product categories including foods, minerals, airplanes and so on. The total sales of company A in 2001 was approximately 75 billion dollars.

Company B deals with 20-30 varieties of soybeans, trading with 20-25 suppliers in the US, Canada, and China. Company B has branches around the US and generated about 20 million dollar in grain trade sales between the US and Japan in 2001. As is usual for Japanese trading companies, only a small number of merchandisers manage and assume the responsibility for company B's food soybean business of company B.

Company B uses both the bulk system and the container system. The movement of soybean by the container system has become more popular since the late 1990's when GM products became an issue. With the IP handling requirement the transaction itself didn't change, but more document work was necessary than before. The IOM bulk system needed to be modified to segregate Non-GM soybeans and to keep them separate from GM soybeans. The suppliers actually do the initial segregation work necessary for IP handling. Company B

visits the supplier's elevators once a year to examine the fields and the facilities, and to communicate with the suppliers about consumer preferences and ways to meet that demand. In the IP system, an identification numbers is allocated to each producer and that number is put on each of the bags of the soybeans prior to shipping. This permits company B to trace back to the individual farmer if the soybeans in a bag violate the Non-GM purity standard.

The assistant manager stated that neither company B nor their suppliers can guarantee the content quality of soybeans, and the contracts generally do not specify the content quality conditions. Standard quality factors such as damage, split, and GM contamination are included in the contract. The assistant manager also pointed out that production contracts are used to procure specialized soybeans when it is not possible to procure them in other ways. Company B is very careful when it is selecting a partner supplier.

The food grade soybean transaction needs to be flexible because it is nearly impossible to strictly state and enforce every condition in the written contract. Informal renegotiation is often required to solve unexpected problems, according to the assistant manager. When the assistant manager and other colleagues negotiate with the suppliers, they do not typically use bluffing as a strategy to gain advantage in the trade. The assistant manager stated that suppliers may respond to the bluff by breaking off the negotiation and/or getting out of the business relationship. The manager stated that for the special soybeans in production contracts, changing the supplier to another is the last option to be used as a means to solve problems.

The manager also stated that it is most important to find trustworthy production areas, suppliers, and producers to avoid risks. Exchange of general trade information about other companies' activities and about the food soybean industry and soybean market is important as a means to maintain good relationships with suppliers. Company B annually holds a meeting with the contracted producers as a means to foster better communications. The assistant manager stated, in addition, that a good personal relationship and a history of successful transactions are also important to keep good business relations.

***First distributor C (interviewee: manager of soybean department)***

First distributor, C, is one of the 70 larger soybean distributors in Japan. Company C imports 40-50 specific varieties of soybeans from the US, Canada, China, Australia, and Brazil. Company C also deals with IOM soybeans and ordinary soybeans for oil. Company C lacks necessary capital and customer buyers to successfully charter bulk ocean vessels for itself. Therefore it has to buy bulk soybeans from the trading companies if it wants to sell the bulk soybeans in Japan. Company C sells the soybeans to the second tier distributors or directly to individual soybean food makers.

In 1998 and 1999 container shipments began to increase dramatically when the industries shifted from IOM to specific variety soybeans. Container shipment has been used for natto soybeans since the latter part of the 1980's, but bulk shipment for other food soybeans was dominant at that time. Although only large firms have the capability to use bulk shipments, container shipments can be used by any firm including smaller firms that lack the experience to charter ocean vessels.

When the Japanese buyers of food soybeans shifted from IOM to Non-GM and variety specific soybeans, company C began to communicate more frequently with the suppliers to discuss the consumers' needs. Before that, company C simply accepted the produced soybeans and didn't talk with the suppliers about the possible improvements of the attributes that would better meet consumer preferences and needs.

Company C trades with local-based medium/small seed companies to obtain the food grade soybeans, rather than larger seed companies. According to the manager, the transactions with small/medium companies are more flexible and open the possibility to make more specific orders for soybeans with detailed characteristics. The manager argues that the larger companies usually do not prefer to manage orders with more detailed specifications. Larger Japanese trading companies generally seek economies of scale in grain and trade with a small number of merchandisers from the larger companies. The larger companies simply cannot afford to deal with various kinds of detailed specifications.

Company C has invested money to develop new varieties of soybeans. Company C works together with a university breeding program to develop the seed. If the seed is successfully developed, a local seed company then buys the license to multiply the seed.

Company C enters into a production contract with a supplier to produce soybeans from the seed, and for the exclusive purchase of the special variety soybean.

The manager stated that quality risk and price (premium) risk are the most important to consider, and that a trustworthy relationship is important to mitigate these different risks. The special variety soybeans in such production contracts are unique and company C cannot easily find alternative suppliers. Since individual suppliers are good at supplying different varieties of soybeans, it is important for company C to keep a good relationship with each individual supplier. The contract with suppliers does not include content conditions, but other standard grade factors such as foreign materials, moisture content, skin crack, and heat damage are included. If the standard grade factors are not fulfilled, the prices are discounted.

A GM test is done before the container is shipped to Japan. The soybeans are also tested at the export in the US. The threshold level for GM is 2%. The soybeans are tested after they arrive in Japan. If the GM contamination is found to be over 2% through the test done in Japan, the soybeans will be sold for oil, and will not be sold for food use. Fortunately, company C has never experienced this problem before. There is a very real risk of contamination since GM soybeans are also screened and bagged in the same facilities in which Non-GM soybeans are handled.

The formal contract does not specify the content quality. If content quality is low, company C generally accepts the soybeans. Company C then negotiates with their customer buyers to accept the soybeans or mixes the soybeans with other varieties to improve the overall quality. In those cases when the quality is too low, company C simply sells the soybeans for other uses than food.

When a problem occurs, company C first investigates the cause of the problem. If the problem is found to be the supplier's fault, the supplier will compensate for it. If the problem is found to be from an uncontrollable cause, company C negotiates with the supplier and determines an equitable settlement.

The relationships between the suppliers generally continue for a long time. Ten to twenty year relationships are quite common, and some relations have endured for more than 30 years.

***First distributor D (interviewee: assistant manager of grain department)***

The first distributor D was originally an oil soybean company when it was founded about a hundred years ago. Now company D and other family firms deal with various materials including oil soybean, food soybeans, cosmetics, plastics, and so on. About 100 employees are working in the group and the total sales amount approximately 2 hundred million dollars.

In 1987, company D exclusively began to import Vinton 81 variety soybean from a supplier in Iowa. The supplier screens and bags the soybeans and the soybeans are all shipped by containers. Currently company D trades with 2 other suppliers in Iowa and Michigan.

In each January, company D hosts selected managers from its suppliers at a meeting where they discuss the contract for the coming year. In February, company D estimates the demand from its customer buyers. Company D then communicates with the suppliers about the estimate, but the formal order is made only after company D actually receives the formal order from the customer buyers. It was unsure who takes the risk of mistakes in forecasting demand from the information obtained in the interview.

If a problem occurs, company D first investigates the cause and then makes it clear who has responsibility for the problem. The way of settling the problem depends on who is responsible for it. If the cause is not manageable by either of the parties, the cost is shared by both of company D and the supplier. Hence, the most important thing is to investigate the cause and which party (if any) is directly responsible.

Company D has had several incidents where insect eggs were found on the exterior of bags of the organic soybeans at import. Quarantine insect treatments were required by Japanese law before they could enter the country legally, so the soybeans lost value as organic soybeans. Company D investigated the causes of the problem and found that the eggs were laid at the supplier's site. Company D then discussed the problem with the supplier. Through discussions, the parties concluded that it would have been almost impossible to have found the eggs and have got rid of them before the soybeans were loaded into the containers. They decided to share the loss of the organic soybeans with the supplier. They discussed alternative methods for preventing this problem, and ultimately decided that the supplier

should load and ship the organic soybeans as soon as possible once the soybeans are harvested.

Production contracts with the suppliers generally do not include specific content quality conditions. Hence, company D generally accepts the soybeans even when the content quality is low. Contracts with customer buyers generally do not specify content quality conditions, so company D negotiates with the customer buyers to accept the soybeans. If the buyers refuse to accept them, company D negotiates a discounted price or sells the soybeans to other uses than foods.

Company D's customer buyers require stable quality and quantity of soybeans. Therefore company D asks the suppliers to establish a reliable and consistent process for production, handling and shipment of soybeans.

Company D sometimes trades with brokers, but it does not use brokers routinely as a business practice because it does not know whether the broker can be trusted until an experience base has been developed. Hence, company D starts dealing with small amounts of soybeans first, then increases the amount gradually as it knows about the broker better.

In the past, when the demand for food soybeans was expected to be large, many Japanese firms entered the food soybean trade, and contracted with suppliers. But once the supply was found to be excessive, the Japanese firms cancelled some of the contracts. This has happened two or three times in 1980's and 1990's. As a result of these actions by Japanese firms, the US suppliers and farmers have become more careful and sometimes hesitate to make production contracts with Japanese buyers. This has made it more difficult for the Japanese buyers to find suppliers of food soybeans than in the past.

***First distributor E (interviewee: the manager of soybean department)***

Company E deals in more than 7 brands of soybeans. One of the brands of soybeans it sells includes a blend of two varieties. Company D buys some of the types from a leading trading company.

Company D uses a production contract when a specific variety of soybean is needed. Since natto makers are more likely to demand special varieties of soybeans than other soybean food makers, many natto soybeans are produced under production contracts. Large

scale natto makers can procure the soybeans and undertake large amounts of risk, but small and medium makers cannot bear such risks as easily. Small and medium scale makers buy soybeans from distributors at higher prices to avoid undertaking risks that are too large to be absorbed. Since natto soybeans are small-seeded and particularly specialized for natto production, they are high value soybeans. If the quality is unsuitable for natto production, the soybeans must be sold for other lower value uses such as feed and oil. Under these circumstances they bring much lower prices. Hence, trading natto soybeans involves much higher risk than other less specified food soybeans.

As company E has shifted to Non-GM soybeans, production contracting has increased and more containerized shipments have been used. However, the features of transactions or relationships with suppliers have not changed significantly even after IP handling was introduced. The relationships with suppliers are typically very long term. Company E has traded with one of its major suppliers for more than 20 years.

***First distributor F (interviewee: the chief manager of the company)***

Company F deals only in bagged soybeans. Company F suspects that IP bulk shipment cannot achieve GM contamination levels low enough to convince its customer makers of their purity. Then it decided to procure only bagged soybeans.

In the case of bagged soybeans shipped by container, there is almost no risk of contamination once the soybeans are bagged and loaded into the containers. This type of handling also reduces the amount of testing and inspection. It is usually sufficient to check the warehouse and screening facilities prior to bagging. Either the supplier or a third-party conducts the inspection. Company F receives only the certification, thereby eliminating the need for checking the facilities for itself. Company F tests GM contamination of the soybeans when it receives them and again before it sells them to the customer tofu makers.

Company F uses a production contract for the half of ordered soybeans and uses spot markets for the rest of the soybeans. This strategy permits company F to control the amount of supply and hedge some of the transaction risks.

Company F has imported organic soybeans from the supplier in Iowa for about 10 years.

***Second distributor G (interviewees: the president, the former president, and the manager of the company)***

Company G deals with both IOM and specific variety soybeans. About half of the total volume of soybeans is IOM, and the rest is variety soybeans. Company G deals with the US, Canadian, Japanese, and Chinese soybeans. Company G buys all the IOM soybeans and some of the specific variety soybeans from trading companies.

Company G began to directly buy specific variety soybeans from the suppliers several years ago. When company G trades with a supplier for the first time, it does not make the whole payment until product is received. It pays half the amount when the soybeans are loaded in the containers. When it receives the containers, it pays the second half of the payment if the soybeans meet standards. Company G has experienced some troubles with suppliers before. In one case, company G received the wrong variety of soybeans, and in another case, it only received half of the contracted quantity. When such problems occur, it is very difficult for company G to negotiate with its suppliers, as a result of the language problem. When company G uses trading companies, this kind of negotiation or communication problem is eliminated, because the trading companies have staff who are bilingual and have more knowledge on trading with foreign suppliers.

According to the interviewees, company G seeks to gain more experience in direct business if direct business is to be used on a wider scale. Since small lot and diverse variety business are expected to increase as the demand for IP handling grows and the diverse needs of customers increase, company G wants to increase its direct business in the future.

***Second distributor H (interviewee: the president of the company)***

Company H buys most of the soybeans it handles from trading companies, and sells them to the local customer makers. But company H began to directly trade with the US suppliers over the past several years. While the amount is still not very large, experience is being developed. Among the reasons why company H started doing business directly with suppliers are ① the fact that company H can directly communicate with the suppliers and ② the fact that the direct business has positive PR effects on the customer tofu makers. However, the negotiations with the suppliers are very difficult, and this kind of

communication difficulty does not occur if company H trades with trading companies, because trading companies have expert employees and much experience of imports, according to the interviewee. Company H attempts to mitigate the quality and quantity risks by trading some alternative suppliers. If problems occur, company H usually negotiates to discount the price.

## **5-2 Cross-case observations**

Based on the individual interviews with food soybean distributors, an attempt will now be made to describe in general how they trade food soybeans. Since the number of interviewees was limited, use of statistical methods is not appropriate to describe the characteristics of food soybean transactions. It is, however, still possible for us to describe the essential facts and the relationships among these facts by observing the information obtained from those individual interviews.

Six major practices described as below were used to characterize the nature of the food soybean transactions.

First, the relationships between Japanese food soybean distributors and US food soybean suppliers are usually longstanding. Relationships that have been in place for more than 10 years are not uncommon and some were even longer.

Second, while some interviewees stated that the distributors have the opportunity to procure undifferentiated food grade soybeans from many alternative suppliers, it is, in fact, quite rare for the distributors to frequently change suppliers. Other interviewees pointed out that it is actually very difficult to find alternative suppliers when they attempt to procure more differentiated special varieties of soybeans that must be procured under production contracts. In these cases it is less motivated to select from a wide variety of alternative suppliers.

Even though problems may have arisen in the transactions, it is rare to change from one supplier to another unless the problems resulted in severe damage to one or both of the parties. When problems do occur, the parties in a transaction usually investigate and identify the causes of the problems and who should take primary responsibility for them. The parties usually carry out the investigation themselves rather than using third parties to arbitrate

conflicts. If a problem is due to negligence or misconduct of a party's activity, the party will take the responsibility for the problem and compensate for the partner party. If a problem is because of some uncontrollable or unexpected event, both of the parties will usually share the costs occurring arising as a result of the problem.

Third, especially when contamination with GM soybeans may be a problem, on-site monitoring production and handling practices by Japanese distributors is not usually intensive. Certification by the producers/suppliers or a third party is used in place of desired inspection and monitoring. Merchandisers employed by Japanese distributors generally visit suppliers only once or twice a year. In some cases, Japanese distributors simply receive certification documents from suppliers and are not personally involved in monitoring the activities for themselves. Japanese distributors do carry out GM contamination tests and quality tests when they receive soybeans. While these tests cannot always detect GM contaminated soybeans, these GM tests are usually believed to be accurate enough to avoid GM contamination by Japanese distributors.

Fourth, concerning soybean quality, it is popular not to include component contents (e.g., protein content and sugar content) in food soybean production contracts. Therefore, Japanese distributors usually bear the risk associated with abnormally low component content. The distributors test the soybeans before they receive the soybeans, but they are usually obligated to accept all the soybeans even in those cases where the content quality is low.

Fifth, informal contracts are commonly used when the customer makers place orders for soybeans to the distributors. Formal written contracts are made only after makers take a final decision to actually buy soybeans from the distributors and then only after testing the content quality of sample soybeans.

Other forms of informal contracts including renegotiation are frequently employed in the transactions between Japanese distributors and US suppliers in the cases where an unexpected problem occurs and the formal contract does not specify how to resolve such a problem.

Finally, some interviewees stated that trust is important in the food soybean transactions. The precise meaning of trust depends on the context and the individual interviewee, as will be observed in more detail in the following sections.

### **5-3 Analysis**

#### ***Risks and the causes in the food soybean transaction***

In this section, the major risks for the soybean distributors in the food soybean transactions are categorized into the following six types: ① GM contamination risk, ② low standard quality risk, ③ supply shortage risk, ④ low content quality risk, ⑤ shipment delay risk, and ⑥ insect damage risk.

GM contamination risk arises when either producers or suppliers, or both deal with GM soybeans besides Non-GM soybeans. In soybean production, there is no natural pollination risk similar to the one in corn production. Rather, the contamination could happen when seed is contaminated or when either of its suppliers or producers inadvertently mix Non-GM soybeans and GM soybeans.

Low standard quality risk arises when uncertainty matters in the fulfillment of standard conditions defined in the US and international grain standards. Split soybeans, discolored seed coats, over-dried soybeans, and too much foreign materials are examples.

Supply shortage risk refers to the possibility that the suppliers cannot fulfill the contracted amount of soybeans or the supply is much less than expected.

Low content quality risk refers to the possibility that the content of important components in the soybeans is lower than expected. Low protein content and low fat content are the examples.

Shipment delay risk is literally the risk of the delayed shipment of the soybeans.

Finally, insect damage risk refers to unexpected insect problems. For example, the insect problem that the assistant manager of first distributor D mentioned arose unexpectedly. Neither of the parties could expect the problem to occur when they made a contract. Thus, it was difficult to prevent the problem before the problem actually happened.

Once insect problems occur, the quality of the soybeans can deteriorate as a result. Or, as in the case of company D, it can significantly decrease the value of soybeans. Although insect problems can be considered as a cause of risk (probably as one of the natural risk factors) that affect the supply and the quality of soybeans, we separately categorize it. This is because insect problems illustrate an interesting and unique issue concerning to the management of the risk as described later in the paper.

Second, the causes of these risks can be categorized into 4 types: ① nature, ② uncontrollable accidents, ③ negligence, and ④ opportunism.

It is sure that natural events such as weather conditions affect the soybean production. Uncontrollable accidents are the non-nature events which cannot be expected or controlled by any means by any parties.

In contrast, negligence can be avoided if each party is careful enough. The drunken driver who hit another car probably did not intend to hit the car. However, if he is cautious enough not to drink too much before he drives, he is much less likely to cause the car accident. Negligence can be caused by lack of carefulness and/or experience. Then, negligence risk mainly refers to the competence of a firm.

Finally, opportunism is a selfish and intentional act for its own interest which sometimes appears as cheating and/or betrayal. In the driver's example above, opportunistic behavior may appear as the drunken driver's dishonest act of hiding a fact somehow that he is seriously impaired due to alcohol intake. Opportunistic behaviors include dishonesty, cheating, betrayal, and any other possible reckless or self-interest actions<sup>9</sup>.

Note that the parties in the food soybean transactions cannot control nature and non-nature uncontrollable causes at all. They can control negligence and opportunism to some extent. Whether the parties can control root causes of a risk does matter and how the parties manage the risks as well will be described in the rest of this chapter. Note that for an event to be controllable, the event needs to be expectable, since it is impossible to control an unexpected event.

We relate the risks and the four types of causes by using the information obtained from the interviews. See Table 10 for the summary of the hazards and the causes.

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<sup>9</sup> See Williamson (1979) for the original definition and discussion of opportunism.

**Table 10.** Risks, the causes, and the coordination methods from the viewpoint of the soybean distributors

<b>Risk</b>	<b>Cause</b>	<b>Coordination</b>
Contamination	<u>Negligence</u> , <u>Uncontrollable accident</u> , <u>Opportunism</u>	Formal contract
Low standard quality (appearance, damage)	Nature (e.g., weather), <u>Negligence</u> , <u>Opportunism</u>	Formal contract, Informal coordination
Supply shortage	<u>Nature</u> (e.g., weather), Negligence, <u>Opportunism</u>	Area contract (Distributors and suppliers share the risk)
Low content quality (component)	<u>Nature</u> (e.g., weather), Negligence, <u>Opportunism</u>	Informal coordination between distributors and makers and/or between suppliers and distributors
Shipment delay	Nature, Negligence, Uncontrollable accident, <u>Opportunism</u>	Formal contract, Informal coordination
Insect damage	<u>Nature (insect)</u> , Negligence	Formal contract, Informal coordination

Notes:

A cause with an underline is a main cause for the risk.

A cause with a wavy line is a relatively minor cause for the risk.

Negligence is the main cause in GM contamination risk in the food soybean transaction. Opportunism may not be a serious cause in GM contamination. An uncontrollable accident could be one of the causes. For example, when seed is contaminated and the parties cannot recognize it before the producers plant the seeds, but the contamination may be found to be significant when the soybeans are harvested.

Nature and negligence mainly influence standard quality of soybeans. Negligence occurs when careless handling in harvesting, loading, unloading, and storing the soybeans results in the damage to the soybean quality. Nature may also matter, but careless handling

affects the standard quality of the soybeans most significantly, according to some distributor interviewees and the information given by a farmer who is engaged in IP handling of food soybean (Karkosh).

Soybean supply is most significantly affected by uncontrollable conditions in nature (e.g., climate and other environmental conditions). Opportunism could also be a cause of the risk for the distributor, when its supplier opportunistically ships the soybeans to other distributors, given the originally contracted distributor a false reason why the supplier cannot collect enough soybeans. Negligence of the supplier may be a concern if the producers contracting with the suppliers decide to opportunistically ship the soybeans to other suppliers for a better price. It would arise as a result of the lack of intensive control/monitoring of the supplier. While the situations stated above were not observed in the interviews, these acts could possibly happen.

Nature affects content quality risk significantly. Negligence could also affect the content quality. For example, if producers are not skilled enough to respond to some of the environmental changes and cannot properly act, and then content quality may probably become low. Opportunism may matter, since the producers and the suppliers may not have strong incentives to work hard to achieve high content quality, at least in the myopic viewpoint because content quality risk is not included in the formal contract (Ramesh).

Shipment risk can be caused by any of the three causes.

Some distributor interviewees stated that shipment delay is not generally a big problem, because they can easily mitigate the risk by ordering soybeans from the suppliers well before the deadline when the distributor needs to receive the soybeans. Hence, it is less interesting and less important to discuss shipment delay risk in this paper.

Finally, insect damage can be caused by nature and negligence. Recall the story of company D once again. The insect problem was basically not avoidable because it was extremely difficult to find the eggs on the bags of the soybeans, but the parties could at least lower the probability of the problem by quickly loading the soybeans and shipping them as soon as possible after harvest or storing in temperature controlled area.

***The management of the risks (Argument about P1)***

(P1) Informal coordination is likely to be used when it is extremely difficult for the parties to calculate expected costs and benefits in the uncertain transactions.

In the interviews, it turns out to be clear that the written contract (or formal contract) between a US supplier and a Japanese soybean dealer generally includes the terms on standard quality and GM contamination.

When suppliers receive the soybeans contracted from individual producers, they generally test the standard quality and GM contamination. When Japanese distributors receive the soybeans from the US suppliers, the distributors generally test the standard quality, GM contamination, and the content quality. If the GM contamination level is found to be above the threshold, the soybean is typically rejected immediately. If the standard quality is lower than the contracted standards, they generally negotiate and discount the soybeans.

However, even though the content quality may be low, there are no formal contractual conditions for the content quality. Therefore, the distributors generally accept the soybeans and negotiate with their customer buyers to accept the soybeans, or sell the soybeans for non-food uses typically at lower prices. So the content quality risk is generally transferred to the distributors and/or the customer makers. In some cases, the distributors negotiate with the suppliers and share the costs to settle the problem.

Supply risk is also shared by both the distributors and the suppliers if the contract is an area contract. In fact, most contracts are area contracts, and fixed quantity contracts are not common in the food soybean production contracts.

Unexpected insect problems are usually solved by informal coordination. Recall once again that the distributor D usually shares the cost of insect damage with the supplier after investigation and renegotiation.

See Table 10 for the summary of these observations.

By relating the risks, the causes, and the methods of managing the risks, it was observed that the parties are likely to use formal contracts to manage the controllable or intentionally manageable risks such as GM contamination risks and standard quality risks, and that the parties are likely to use informal methods of coordination (or renegotiation) to manage somewhat more uncontrollable risks such as content quality problems.

Note that it is possible to calculate a distribution and an expected quality of soybean content relatively easily by observing the past content qualities. Even if it is impossible to accurately predict content quality, it is at least possible to calculate average content quality. This may allow Japanese distributors to calculate expected cost/benefit of uncertain component quality levels. However, it was observed that content quality is not usually included in formal contracts at least for the present.

Therefore, P1 seems to be consistent to the observation of the fact that GM contamination and standard quality are included in the formal contract and insect problems are not included in the formal contract. However, P1 may not be consistent with the fact that component quality is not included in the formal contract.

From the above discussion, it can be argued that whether the event is controllable is more related to the risk management method, than whether the expected cost/benefit of the event can be calculated.

To examine this proposition further with the information currently available, it may be useful to consider necessary conditions for the formal contracts to work well enough for mitigating the controllable risks. The observations retain some implications for this problem as below.

First, all the parties must believe that the risks are expectable and controllable. This is a quite natural idea since it is generally true that nobody wants to bear costs as a result of an event which none of the parties can control.

Suppliers and producers should understand that they can mitigate the risks of GM contamination and low standard quality by careful handling. Some distributor interviewees stated that they hold meetings with producers one or more times in a year and explain the importance of IP handling and other careful in handlings. Such an activity can be considered as an effort by distributors to enhance the producers' understanding and to encourage them to

handle the soybeans more carefully. As a result of such meetings, the distributors can expect better handling by the producers and suppliers. Then, such activities by distributors can be one of the methods for them to control the risks of GM contamination and low standard quality in the absence of a formal contract.

Then, only if the parties know that the risks are controllable somehow, will the formal contracts be the easiest and most efficient short cut to manage the risks in the transactions. When the parties have to deal with uncontrollable risks, formal contracts may not be the most efficient way.

Another necessary condition for formal contracting to be the best method for risk management is the ability to detect whether or not the partners properly conduct their tasks. If this is not possible, neither parties is able to precisely evaluate the actions of the other party. Since measuring performances is difficult, the risk of opportunistic behavior by either or both parties may increase, thereby making formal coordination methods inefficient.

In the food soybean transactions, the parties can measure the degree of GM contamination and the standard quality by using sample tests relatively easily and accurately. While sampling used in these tests is not always consistent with the true attributes of the soybeans, the tests are practically good enough to measure the properties of the soybeans and determine whether the partner parties did proper jobs.

When the parties know that a certain risk is controllable, the parties manage the risk in formal contracts. But if the parties believe that the particular risk is caused by uncontrollable factors, it is very difficult to include the condition in the formal contract, and then the parties have to look for other ways to coordinate the transaction.

From the above discussion, it is not concluded that P1 is consistent with all of the observations. Based on the discussion, a modified proposition P1' follows:

(P1') A formal contract is likely to be used if both parties believe that the event is controllable and if the performance of the actions is detectable.

***The types of trust observed in the food soybean trade (Argument about P2 and P3)***

(P2) Trust is a factor for making informal coordination possible.

(P3) Three types of trust (contractual trust, competence trust, and goodwill trust) exist in the food soybean transaction.

In the interviews it has been observed that most distributor interviewees mentioned that trust is important in the food soybean transactions. The precise meaning of trust, however, is observed to depend on the context in the individual interviewee's comments. Therefore, first of all, it is necessary to distinguish and categorize the observed meaning on trust in each context.

As Sako (1995, 1998) describes, contractual trust is a necessary condition for the parties to make a contract between them. They would not make any contracts if they don't trust each other in the sense of contractual trust.

We can reasonably assume that both of the Japanese firms and US suppliers trust each other at least in the sense of contractual trust, because the trading companies and distributors actually make a contract with the suppliers in the food soybean trade. Otherwise, we would observe a lot fewer contracts in the food soybean transactions. Contractual trust could be an interesting topic if many violations of formal contracts and related conflicts among the parties are observed. However, this is not the case in the food soybean transactions. Production contracts in the food soybean transactions are usually longstanding, and then somewhat successful. Therefore, we will not intensively discuss contractual trust in this paper.

Careful observation of the comments made by the distributor interviewees indicated that the interviewees, in fact, mean more than simply contractual trust. The vice director of trading company A stated that trust is important to make renegotiation possible and effective when a problem occurs in the transaction. It seems clear that the vice director expects its supplier to comply with company A's request for renegotiation when a problem occurs, even though these activities are not usually explicitly specified in the formal contracts. In addition, as other distributors mentioned in the interviews, Japanese distributors and US suppliers have

to individually or sometimes jointly investigate the causes of a problem. They usually detect who is primarily responsible for the problem through their own investigation without depending on arbitration by third parties.

Suppose that either of the distributor or the supplier behaves opportunistically in the event of investigation and renegotiation, and tries to hide the true causes or gives false information to the other party to protect its own interest. Then renegotiation will be probably unsuccessful in most cases. Hence, to settle problems in informal coordination, the parties should know or at least should believe that the partners will not behave opportunistically in the investigation and the renegotiation.

Note that if a party is trustworthy only in the sense of contractual trust and not in the sense of goodwill trust, that party does not necessarily always behave honestly, especially when behaving honestly results in accepting a loss for the party. Thus, implementing the renegotiation and investigation requires a higher degree of trustworthy relationship with goodwill trust than contractual trust between the parties.

Trust which the vice director of trading company A referred to obviously does not mean competence trust. His comment implied that he would expect a supplier's honest actions even though the formal contract does not specify how the parties should act when an unexpected problem occurs. Thus, we can consider that the statement by company A implies that the distributor not only expects contractual trust but also expects goodwill trust in the food soybean transaction.

In other contexts, they sometimes mean competence trust. For example, the assistant manager of trading company B stated that the most important task required to mitigate risks is to find trustworthy suppliers, producers, and the production areas. In this context, it could be noted that the manager referred to the supply reliability, or competence trust in the suppliers and producers, rather than goodwill trust in them.

The observation described above implies that we need to recognize that all the three different types of trust categorized by Sako (contractual trust, competence trust, and goodwill trust) exist in the food soybean transactions. In addition, note that some interviewees pointed out that higher levels of trust (goodwill trust) than contractual trust are important for making

informal coordination such as renegotiation possible. These facts are considered to be consistent with the implications that the propositions 2 and 3 indicate.

### ***The roles of trust (Argument about P4)***

(P4) Trust reduces transaction risks/costs

We have observed that competence trust is important before and after the parties have begun food soybean trades (recall company B's observation). Japanese firms seek out competent trustworthy suppliers, producers, and production areas before they make a contract. After they make a contract, they exchange information including market and demand trends. Japanese distributors visit producers and suppliers and explain to them why they require careful handling of soybeans.

Goodwill trust is also important because the parties generally attempt to solve unexpected problems through informal coordination such as renegotiation, as company A stated.

Many distributor interviewees invest in educating their suppliers and producers and exchanging information through holding annual meetings with producers and suppliers. Competence trust and goodwill trust could be obtained through education and information exchange. It can be argued that competence trust and goodwill trust have the effect of mitigating problems of negligence and opportunism, and thereby decreases the need of intensive monitoring. As shown in Table 10, negligence and opportunism are considered to be the causes of almost all of the hazard events. Therefore, maintaining trust-dependent relationships in the transaction can reduce the probability of all of these hazards occurring.

We have observed that goodwill trust plays an important role in allowing the parties to settle the problems caused by uncontrollable factors through informal coordination. Without goodwill trust, it will be very difficult to internally settle the problems and more problems will need to be arbitrated by third parties.

These observations may allow us to argue that trust reduces transaction costs such as monitoring costs and arbitration costs, arguing that the observations are consistent with the proposition 4.

In order to confirm that the suggestion is valid by using more data in future research, we may be able to refine the proposition 4 as follows:

(P4') Competence trust reduces the probability of the risks caused by negligence, while goodwill trust reduces the probability of the risks caused by both of negligence and opportunism.

### ***The development of trust (Argument about P5)***

(P5) Trust is developed through both calculative and non-calculative processes.

Now, we may wonder why longstanding relationships (and maybe trust dependant) are popular in the food soybean transactions.

Company B stated that changing from one supplier to another is the last option to solve conflicts since the soybeans under production contracts are so special that it will not be an easy task to find the alternative suppliers. Many interviewees stated that they preferred longstanding relationships with the suppliers and such a relationship basically assumes internal coordination to solve problems in the transaction as company B stated.

Some food soybean dealer interviewees mentioned that it would be possible to find alternative suppliers. But in fact, most of the relationships between the distributors and the suppliers are longstanding one. Some of the interviewees pointed out that longstanding relationships with trustworthy suppliers are a key factor in the food soybean transaction. These observations indicate that while the distributors recognize the possibility of finding alternative suppliers, they tend to choose longstanding relationships with specific suppliers which may be trust-dependent relationships.

The vice director of trading company A stated that trust is important to make renegotiation possible and effective when they must settle problems. This statement implies

that he recognized the important role of trust when they attempt to settle problems in the food soybean transaction. He also stated that a long-term relationship is important in establishing a trustworthy relationship, and some other distributor interviewees agreed on the point.

Based on these statements, we can observe some form of interaction between longstanding relationships and trust. The parties seek out trustworthy partners in terms of competence trust before they enter into business relationships as company B stated. After they enter into business relationships with those partners who possess competence trust, longstanding relationships help them to foster another type of trust, goodwill trust, between them.

Company B stated that exchanging information with its suppliers on market trends, activities of other trading companies and consumer's wants is also helpful for improving the relationship. Company B stated that exchanging this kind of information helps the parties to understand each other, and helps them to build a tighter relationship between them. While the information is not always necessarily directly related to their business, even casual information exchange can be important in understanding each other. This plays a role in building up good relationships with its suppliers, according to company B.

Some other distributors, as well as company B, visit their suppliers at least once a year, and hold meetings with its suppliers and producers. These activities can be interpreted as an effort to establish a trust-dependent governance structure rather than monitoring the partners. In fact, the distributors cannot monitor the suppliers and the producers all around year. Visiting once a year is simply not enough to effectively monitor their performance in the absence of intent and goodwill. Therefore, it is more reasonable to consider these activities as communications designed to establish a higher degree of trust as a substitution for monitoring them more intensively.

Such communications are helpful to foster both competence trust and goodwill trust. Besides these communications, trading companies A and B stated that personal relationships between a merchandiser of the Japanese firm and a supplier is also important for keeping good relationship between the parties. The manager of the first distributor D agreed on this point and stated that the president of the company D and the president of one of its main suppliers have been good private friends for several decades. This kind of informal

relationship may ultimately help to maintain a trustworthy long term relationship in the business. The longstanding relationships accompanied with such personal relationships and casual information exchanges have helped the parties to understand each other better. As a result, it has helped establish trust-dependent relationship between them.

There is a need to understand the mechanism for starting a relationship. How do parties begin to enter the trust-dependent relationship when they did not trust each other at the beginning of their relationship? None of the second distributors F, G, and H had conducted direct business with the suppliers until several years ago. So they are relatively new entries to the international food soybean trade. All of the three interviewees pointed out the difficulty of communications and negotiations with the US suppliers, mainly because of language problems. As the president of company G stated, these newly entering distributors have not obtained enough experience and knowledge in the food soybean trade. Trust has not been established between these second distributors and the suppliers yet. Therefore, they need to manage the higher subjective/objective risks in the transaction.

One of the methods used to deal with the risks is to start with dealing with a small amount of contracted soybeans. Another method is that a distributor makes full payment only after the actual receipt and testing of the soybeans, as distributor G does. Since these second distributors want to continue doing direct business and to increase the direct procurement from the suppliers, the distributors will increase the size of the trades as they gain knowledge and experience in the transaction and as the distributors and the suppliers understand each other more fully.

It is reasonable to assume that both a calculative and a non-calculative process result in the establishment trust in the food soybean transaction as Sako and Williamson pointed out. We can argue that the proposition 5 is consistent with the observations.

There is insufficient data to determine whether the parties intentionally make these efforts in order to foster either or both of the two types of trust discussed in this paper. However, the limited observations still allow us to make up the hypothesis to be examined in the future research. It was argued that the main reason for a distributor to hold the annual meetings is to foster the competence trust through the education of the suppliers and the producers. Both competence trust, and goodwill trust were observed to exist and play an

important role in the food soybean transactions. From this argument, we may be able to refine the proposition 5 as follows:

(P5') The distributors are calculative when they educate the partner suppliers and producers and exchange information to foster competence trust, while education and information exchange repeated and continued for a long time unintentionally foster goodwill trust.

## **CHAPTER 6**

### **CONCLUSION**

Through the case study analysis, it has been observed that the five propositions are in general consistent with the information obtained from the interviews. The findings are summarized below.

In the food soybean transaction, it is observed that there are controllable and uncontrollable sources of risk. The Japanese distributors managed controllable risks by utilizing formal contracts while they managed uncontrollable risks by using informal coordination (P1'). All of three types of trust (contractual trust, competence trust, and goodwill trust) are observed (P3) and these types of trust play important roles in making informal coordination between the distributors and US suppliers possible (P2). In addition, these types of trust can reduce transaction costs or risks in the food soybean transactions (P4). Finally, trust in the food soybean transactions is fostered by both calculative and non-calculative processes used by the parties in the transactions (P5).

By analyzing the roles of trust in the food soybean transactions, it was revealed that Japanese distributors strategically and sometimes non-strategically choose the governance structure based on the types of risks and the levels of trust between Japanese distributors and US suppliers. It was argued that Japanese distributors can strategically foster trust in their suppliers' ability to produce and handle soybeans properly. In contrast, goodwill trust appeared to be a fruit of non-strategic behavior such as personal relationships and casual communications between Japanese merchandisers and US suppliers.

Tables 11 and 12 summarize the findings and analysis results.

**Table 11.** Summary of findings

<b>Findings</b>
① Longstanding relationships are common.
② It is difficult for distributors to find alternative suppliers.
③ Monitoring is not intensive.
④ Casual exchange of general information on markets.
⑤ Content quality is not included in formal contracts.
⑥ Informal coordination is common.

**Table 12.** Summary of analysis results

<b>Analysis Results</b>
① Informal coordination was likely to be used for managing uncontrollable risks.
② Three types of trust (contractual trust, competence trust, and goodwill trust) are observed.
③ These types of trust can be necessary conditions for informal coordination.
④ Thus, three types of trust can reduce transaction costs or risks in the food soybean transactions.
⑤ Trust can be fostered by both calculative and non-calculative process.

The findings and analysis may have some important implications for US suppliers. It would be useful for US suppliers who want to initiate soybean trading with Japanese distributors to understand that Japanese suppliers look for suppliers who hold three types of trust. Entering the relationship with an appreciation of these expectation could enhance the opportunity of a successful long term trading relationship. It is an obvious fact that suppliers who do not hold contractual trust will be less able or perhaps unable to make contracts with any distributors. Competence trust is another necessary condition for successful business in

the food soybean transactions. The ability for US suppliers to produce and handle soybeans in a stable and consistent manner is quite important. Suppliers without competence trust before they initiate transactions need take the steps necessary to prove that they hold competence trust. One possible approach to the establishment of competence trust is to trade just a small amount of soybeans with distributors for trial. This trial may take several years to prove that the supplier has the capability to supply consistent quality and quantity of soybeans.

Once suppliers have proved that they hold competence trust, there will be a higher probability of continued contractual relationships with distributors for a long time. But competence trust is not a sufficient condition for successful relationships. Since there is a possibility that hazards caused by uncontrollable factors harm parties in the transactions, the parties must be able to manage the problems occurring from such uncontrollable factors. In many cases, parties solve problems caused from uncontrollable factors through informal coordination mechanism such as renegotiation. Goodwill trust may play important roles in helping the parties to employ informal coordination. Goodwill trust can be fostered by both calculative and non-calculative processes. Longstanding relationships can help parties in the transactions to develop goodwill trust in a non-calculative manner, including casual exchange of general information on the soybean market, activities of other companies, and so on. Information exchange through educational seminars for producers conducted by distributors may also be helpful for developing goodwill trust.

To enhance the justification of these propositions, further research will be necessary. Since the available information was not rich enough to completely reject possible rival hypotheses, it is crucial for us to collect more detailed information through dedicated research. More in-depth case observations of firms' recognition and management of risk, firms' intension to foster trust, and the roles of each type of trust in the transaction will be especially useful and interesting. In addition, the information from the perspective of US suppliers will be useful to describe the transactions and the roles of trust in the transactions more vividly.

From the theoretical aspects, it may be useful and important to consider the role of reputation and experience in the food soybean transactions using the framework of repeated

games. Such a game theoretic approach can give us different perspectives on the role of trust and can generate alternative hypotheses to explain what we have observed.

We believe that this paper could, at least, describe essential factors in the food soybean transactions and then point out what should be discussed in future research. We thus hope that this research will be a good starting point for the fruitful future research.

## REFERENCES

- Adams, C.L. and Goldsmith, P.D. "Conditions for Successful Strategic Alliances in the Food Industry." *International Food and Agribusiness Management Review*, Vol.2, No.2, 1999, 221-248
- Axelrod, R.M., *The Evolution of Cooperation*, New York: Basic Books, 1984
- American Soybean Association, *Marketing Food-Grade Soybeans in Japan*, The 10<sup>th</sup> Edition, Tokyo: American Soybean Association, 2002
- Baumel, P.C. and Wallize, J.A. "Container shipment-A Solution for Boxed-In Elevators." *Feedstuff*, 1973
- Bullock, D.S. and Desquilbet, M. "The Economics of Non-GMO Segregation and Identity Preservation." *Food Policy*, Vol.27, No.1, 2002, 81-99
- Coase, R.H. "The Nature of the Firm." *Economica*, 4, 1937, 386-405
- Coase, R.H. "The Firm, the Market, and the Law." in Coase, R.H., *The Firm, the Market, and the Law*, Chicago: The University of Chicago Press, 1988
- Fehr, W. "The Cost of the Journey." *Consortium to Address Social, Economic, and Ethical Aspects of Biotechnology*, Iowa State University, 2002
- Food and Agriculture Organization of the United Nations, FAOSTAT, Agriculture Data, (<http://apps.fao.org/cgi-bin/nph-db.pl?subset=agriculture>)
- Food Industry Center, *Identity Preservation Manual*, Tokyo: Food Industry Center, 2000, (In Japanese)
- Fudenberg, D. and Tirole, J., *Game Theory*, Cambridge: The MIT Press, 1991
- Ginder, R.G. "Channeling, Identity Preservation and the Value Chain." *Working Paper*, Iowa Grain Quality Initiative, Iowa State University, 2001
- Hahn, D.E., Larson, D.W., et al. "Risks and Returns in Value Added Supply Chains for Specialty Corn." *International Food and Agribusiness Management Association Meeting*, 2000
- Hobbs, J.E. "A Transaction Cost Approach to Supply Chain Management." *Supply Chain Management*, Vol.1, No.2, 1996, 15-27
- Hobbs, J.E. "Measuring the Importance of Transaction Costs in Cattle Marketing," *American Journal of Agricultural Economics*, November 1997, 1083-1095

- Hobbs, J.E. and Young, L.M. "Closer Vertical Co-ordination in Agri-Food Supply Chains: A Conceptual Framework and Some Preliminary Evidence," *Supply Chain Management*, Vol. 5, No. 3, 2000, 131-142
- Hobbs, J.E., Kerr, W.A. and Phillips, P.W.B. "Identity Preservation and International Trade: Signaling Quality across National Boundaries." *Canadian Journal of Agricultural Economics*, Vol.49, 2001, 567-579
- Hurburgh, C.R. Jr. "Initiation of End-User Specific Grain Marketing at Iowa Elevators." *MATRIC Working Paper 97-MWP 2*, Midwest Agribusiness Trade Research and Information Center, Iowa State University, January 1997
- Hurburgh, C.R. Jr. and Hofstrand, D. "Supply Management Organizations for Grain-The Development of Innovative Growers, LLC-." *Working Paper*, Iowa Grain Quality Initiative, Iowa State University, March 2001
- Karkosh, A. "Identity Preservation-What are the necessary steps for I.P.?" *Soyfoods: From Field to Table Conference*, 2002
- Kiyono, S. "Tofu Food Chain and Its Structural Change." *Bulletin of the Department of Food Economics, Nihon University*, No.20, 1992, (In Japanese)
- Milgrom, P. and Roberts, J., *Economics, Organization and Management*, Englewood Cliffs: Prentice-Hall, 1992
- The Ministry of Agriculture, Forestry, and Fishery of Japan (Edit.), *Japanese Soybean*, Tokyo: Chikyu-Sha, 1977, (In Japanese)
- The Ministry of Agriculture, Forestry, and Fishery of Japan, *Daizu ni Kansuru Shiryo (Data of Soybean)*, 2000 [a], (In Japanese)
- The Ministry of Agriculture, Forestry, and Fishery of Japan, *Shokuryo Jukyu Hyo (Food Supply-Demand Tables)*, 2000 [b], (In Japanese)
- Morrow, J.L., Batista, J.C., and Hansen, M.H. "Measurement Issues in Trust Research: Are We Measuring What We Think We're Measuring?" *International Food and Agribusiness Management Association, World Food and Agribusiness Congress*, 1999 [a]
- Morrow, J.L., Batista, J.C., and Hansen, M.H. "Trust and Its Impact on Members of a Farmer Marketing Cooperative." *International Food and Agribusiness Management Association, World Food and Agribusiness Congress*, 1999 [b]
- Nihon Keizai Shimbun, Inc. (Japan Business Daily, Inc.), *Trend Watch-Food*, 1999, (<http://www.nikkei.co.jp/trwatch/taberu/taberu.html>), (In Japanese)

- Ooya, Y. 'The Japanese Soybean Demand Structure of the Miso Manufacturers', *The Investigation of the Distribution System the Demand Factors of Japanese Soybean and Wheat and -The Second Report*, 2000, 38-61, (In Japanese)
- Ooya, Y. "An Important Factor of the Structural Changes of Miso-Processing Industry." *Bulletin of the Department of Food Economics, Nihon University*, No.30, 2002, (In Japanese)
- Palay, T.M. "Comparative Institutional Economics: The Governance of Rail Freight Contracting," *The Journal of Legal Studies*, Vol. XIII, No.2, 1984, 265-287
- Prentice, B. "Re-engineering Grain Logistics: Bulk Handling vs. Containerization." *Transportation Research Forum*, Proceedings Issue: 40th Annual Meeting, 1998, 339-352
- Ramesh, N. "Contract Design in Soybean Production." *Master Thesis*, Iowa State University, 2002
- Reichert, H. and Vachal, K. "Identity Preserved Grain-Logistical Overview." *Staff Paper*, Agricultural Marketing Service, USDA, January 2000
- Rice, J.B. Jr. "Strategic Partnership: Collaboration, Alliances and the Coordination Spectrum." *Logistic Solutions*, 2002
- Saeki, N. "Mugi Daizu Mondai No Tettei Kenkyu (The Complete Research on Wheat and Soybean Production and Distribution)." *Nogyo Kenkyu (Agricultural Research)*, No.13, 2000, 19-120, (In Japanese)
- Sako, M. "The Information Requirements of Trust in Supplier Relations: Evidence from Japan, Europe, and the United States." *Working Papers*, International Motor Vehicle Program, Massachusetts Institute of Technology, 1995
- Sako, M. "The Role of Trust in the Japanese Automobile Manufacturer-Parts Supplier Relations." in Fujimoto, T., Nishigushi, T., and Ito, H. (Edit.), *Readings Supplier System*, Tokyo: Yuikaku, 1997, 91-118, (In Japanese)
- Sako, M. "Does Trust Improve Business Performance?" in Lane, C. and Bachmann, R. (Ed.), *Trust within and between Organizations*, New York: Oxford University Press, 1998, 88-119
- Shimizu, A. "The Structural Change of the Food System of "Nattou", and Correspondence of Nattou Manufacturers." *Journal of Food System Research*, Vol.8, No.3, 2002, 13-31, (In Japanese)

- Shimizu, T. "The Supply-Demand Trend of Soybeans and the Challenges for Japanese Soybean Promotion." *Norin Kinyu*, Tokyo: Norinchukin Research Institute, October 2000, (In Japanese)
- Shokuhin Sangyo Center (The Food Industry Center), *The Report on the Distribution Manual for Quality Control of Imported Soybeans and Corns*, Tokyo: Shokuhin Sangyo Center, January 2001, (In Japanese)
- Shokuhin Sangyo Shimbunsha (Food Industry Daily), *Daizu Yuryo Nippo (Soybean and Oil Seed Daily)*, June 28<sup>th</sup>, 2002, (In Japanese)
- Soybean Stable Supply Association, *The Report on Imported Food Grade Soybeans*, Tokyo: Soybean Stable Supply Association, 1994, (In Japanese)
- Soybean Stable Supply Association "The Report of the Survey Research on the Food Soybean Use." *The Daizu*, Tokyo: Soybean Stable Supply Association, February/March, 2001, 1-15, (In Japanese)
- Sporleder, T.L. "Vertical Network Alliances within the Global Food System with Emphasis on the Role of Trust." *International Food and Agribusiness Management Association, World Food and Agribusiness Congress*, 1999
- Sporleder, T.L. and Goldsmith, P.D. "Alternative Firm Strategies for Signaling Quality in the Food System." *Canadian Journal of Agricultural Economics*, Vol.49, No.4, 2001, 591-604
- Tachikawa, M. "The Interaction of Vertical and Horizontal Networks in the Non-GMO Identity-Preservation System." *The International Sociological Association, The XV World Congress of Sociology*, 2002
- Takahashi, M. "The Tofu Food System and the Perspective of Tofu Produced from Japanese Soybeans." *The Investigation of the Distribution System and the Demand Factors of Japanese Soybean and Wheat -The First Report*, 2000, 34-52, (In Japanese)
- Vachal, K. and Reichert, H. "U.S. Containerized Grain and Oilseed Exports Industry Profile: Phase 1." *Staff Paper*, Agricultural Marketing Service, USDA, November 2001
- Vandenburg, J.M. et al. "Impact of Identity Preservation of Non-GMO crops on the Grain Market System." *Staff Paper* = 00-03, Purdue University, April 2000
- Williamson, O.E. "Transaction –Cost Economics: The Governance of Contractual Relations." *The Journal of Law and Economics*, Vol. XXII, No.2, 1979, 233-261
- Williamson, O.E., *The Economic Institutions of Capitalism*, New York: The Free Press, 1987

Williamson, O.E. "Calculativeness, Trust, and Economic Organization." *The Journal of Law and Economics*, Vol. XXXVI, No.1, 1993, 453-486

Yin, R.K., *Case Study Research Design and Methods*, The Second Edition, London: SAGE Publications, 1994

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