The Demise of Traditional Fish Distribution Structures in Japan?
-a case study of fish supply chains from Norway to Japan

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Abstract:

Fish is at a slow pace increasingly being distributed in Japan through direct channels omitting the use of the traditional wholesale fish markets. Supply chain actors exporting and importing Norwegian fish explain that due to inefficiencies in using markets, these markets represent "excess intermediaries". Based on a preliminary case study of the distribution of Norwegian mackerel and salmon to Japan, the impact of direct distribution compared with fish wholesale markets on the downstream part of the supply chain within Japan is analysed. Frozen mackerel and fresh salmon, the main fish export seafood products from Norway to Japan, are focal products in the case. Choice of distribution structure is treated from a combined logistics and marketing perspective complimented by an industrial network approach. The aim is to reach new preliminary understandings regarding physical and informational technicalities of the chains, laying a basis for analysing features of managing these two different types of supply chains in a common network. It is argued that there are no short-term clear-cut advantages in using direct distribution forms in Japan. Immediate advantages of direct distribution of Norwegian fish to Japan can arguably be created in developing movements of large quantities of similar goods in repeated transactions. However, use of wholesale Japanese fish markets also display potential for efficiency development. The potential demise of traditional Japanese fish distribution structures in Japan will expectedly be a slow process also dependent on changes in business, societal, and natural environment context factors

Key words:

Japanese wholesale fish markets, direct distribution, food supply networks, product traceability, product safety and quality

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1. Introduction

Japan is the second largest national economy in the world, only surpassed by USA. After decades of strong growth, the Japanese economy has slowed considerably down during the 1990s. Japanese consumers are very price conscious, and have a high savings rate. This has had a decisive impact on the Japanese willingness to pay for fish products the last years. Fish consumption is an important part of the Japanese diet. Domestic catch accounts for 60% of the consumption. In addition, some of the Japanese catch is exported. A wide variety of different fish species are offered on the Japanese market. The main two Norwegian types of fish, mackerel and salmon represent a small portion of the total Japanese fish market.

Japan is considered as a highly impenetrable market mainly due to its rigid distribution structures. Traditionally, Japanese distribution is characterised by "locked-up" relationships between channel members in terms of vertical integration based on ownership (called keiretsus) or long-established relationships where duties, trust and obligations are important factors (Min 1995). Actor bonds are carefully maintained and developed. Long-term commitment is accordingly therefore of importance in these business relationships. In our sample the majority of relationships go back further than 20 years.

This system has been described as confusing and complex with labyrinthian distribution structures and practices (Shimaguchi and Lazer 1979) and inefficient and archaic (Lazer et al. 1995; Rajaratnam and McKinney 1995). However, this picture is changing, with international retail chains to a greater degree operating successfully in Japan (Lothia et al. 1999). This change may also be associated with the economic slowdown in Japan starting in the 1990-ies and continuing to this day. Reduced purchasing power among Japanese consumers has tightened competition among Japanese firms distributing goods and services to Japanese consumers. Focusing on food distribution, Japanese food retail is characterised by small and independent shops. In restaurant and catering the picture is similar regarding the size of the business units; it is mainly small individual enterprises competing with each other. Gradually business units in Japanese food retail and restaurants are becoming organised into chains that are achieving an increased market share. Several foreign retailers now have success in establishing distribution networks in Japan, though this involves a sublime form of cooperation with Japanese actors. Carrefour attempted a head-on challenge towards the Japanese market that resulted in boycott type reactions in the Japanese market that eventually lead to that this French retailer chain, with long global marketing experience, pulled out of the Japanese market.

In domestic Japanese fish supply chains the picture of traditional modes of distribution is evident. Fish caught by Japanese fishermen are distributed through two layers of markets, first through a seaside market, allocating goods to fish distributors, and then through a second layer of regional wholesale markets, allocate goods to restaurants and retail. This distribution structure is now gradually changing. It is primarily Japanese producers of consumer-packed fish products that have started omitting the use of one or two levels of fish markets with the aim to cut costs in acquiring fish raw material.

Japanese fishermen catch 60% of the fish distributed in Japan. Of the imported fish, Norway primarily exports wild-caught frozen mackerel and aqua-farmed fresh salmon to Japan. These fish products have different features when viewed from a supply chain perspective. Mackerel is a high volume and a low-value per. kilo product with prolonged durability due to freezing. Fresh salmon has a high value per kilo, and is very perishable. Both a majority of the frozen mackerel and fresh salmon distributed from Norway to Japan are channelled through wholesale fish markets that are regionally located throughout Japan. The Japanese wholesale fish markets represent trading facilities; it is a physical place where goods are stored and distribution channel intermediaries meet to trade seafood products. This is a specific mode of

organising trade that also impacts on the flow of goods since fish traded at wholesale markets also are demanded to be physically present at this facility.

2. Considerations concerning Purpose, Method, and Basic Approach

The purpose of this paper is to compare, in the case of supplying fish products from Norway to Japan, features of using Japanese wholesale markets with features of direct distribution. This question involves regarding the numbers and roles of intermediaries of a distribution channel, a classic feature of marketing channels approach (Gripsrud 2004). In this study, however, the posed research question, regarding whether there is soon to be a demise of the traditional form of distribution of fish in Japan, is studied in further detail not simply by considering numbers of supply actors and marketing or "transaction-features" regarding roles of variable numbers of supply actors. Through applying an industrial network approach (e.g. Håkansson 1982, Håkanson and Snehota 1995, Gadde and Håkansson 2001, Jahre et al. 2006) complimented by understandings from logistics, understanding is sought by directing attention to logistical technicalities regarding distributing fish products. More specifically this involves directing attention to interaction the technical flows of information and goods have with a network of actors managing goods distribution. This type of network approach is founded on developments through the NETLOG and NewMark projects carried out at the Norwegian School of Management (BI) between 2001 and 2006.

Understanding the structure and dynamics of supply chains and the impact of their contingencies is complex. Based on the NETLOG IMP-oriented logistics approach (Jahre et al. 2006) and studies of complete supply chains of food (Engelseth 2007), an approach to understanding supply chains in their context is emerging. An important view preceding this study is accordingly that a greater understanding of the technicalities of an industrial network, placing focus on resource use by actors through activities, will shed light on features of managing individual supply chains embedded in a wider setting consisting of a network of interacting supply actors with differing functional aims. Within this perspective the term "supply chains" is regarded as a combined logistical and marketing system with definable borders (see Gammelgaard 2004). Individual supply chains, with an empirical focus on a specific type of product, may from such a view be regarded as an empirically describable system embedded in a wider and immediate network context of actors managing multiple supply chains (Håkansson and Persson 2004). The industrial *"supply network"* is accordingly regarded as the business context of supply chains (other contexts may e.g. be classified as "natural environment" and "societal").

It is in this study within the boundaries of supply chains considered how logistical and marketing "efficiency", or alternatively "value creation" (Huemer 2006) as business objectives, are impacted by these two differing modes of managing the distribution of Norwegian fish distribution in Japan. Discussing in further detail issues concerning nuances of different meaning between the terms "value creation" and "efficiency" is regarded out of the bounds of this paper. "Logistics" is in this regarded as value creation through efficient provision of products in the hands of an end user, and marketing, regarded with a business-to-business focus (this predominately "back-stage" supply chain research shifting focus away from the consumer), concentrated on retaining and developing business relationships supporting goods provision to end-users. Through this comparative study, the technicalities of combined marketing and logistical information flows supporting more purely logistical flows of goods, are confronted with actor perceptions of business functionality regarding these two alterative distribution structures for Norwegian fish in Japan. In line with marketing channels studies (Alderson 1965, Gripsrud 2004) and aligned with the supply chain management (SCM) "model" drawn by Lambert et al. (1998), a "complete supply chain approach" is applied, considering features of distributing the studied products from a point–of-origin as raw material in Norway to retail and restaurants in Japan. The use of this approach is not only based on these preceding lines of theoretical development. The distribution of foods has

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certain "peculiarities" (Engelseth 2007c) that should influence how research concerning food supply chains is designed. Features of foods that stand out concerning importance is an ability to compare fish safety (e.g. poisoning threats) and quality (e.g. freshness or impact of modes of production) features of these products placed in the hands of the end-user with transformations of goods upstream in a supply chain. Food product safety quality from the obviously vital (given current marketing and logistics management definitions) end-use perspective and informing about these features (product traceability) are dependent on all preceding goods transforming activities in a supply chain (Engelseth 2007).

This is a preliminary investigation of these supply chains, and therefore a wide range of topics has been covered during interviews. Given the exploratory nature of this investigation, informants were motivated by the interviewer to suggest up new topics not accounted for in an applied interview guide. The research topic chosen as the theme of this paper, is actually one such emergent issue from these interviews. Interviews, representing the basis for the following case narrative, were carried out in the period of a few weeks towards the end of 2006. Data collection involved a study tour to Japan to observe facilities there and interview Japanese key informants. A series of key-informant interviews of different actors (with varying roles) in supply chains for frozen mackerel and fresh salmon distributed from Norway to Japan was carried out.

Case study research strategy is applied since this is viewed as an appropriate research design that supports a comprehensive study of complex complete supply chains embedded in networks, involving describing and analysing the complexity of transformations of goods through the use of multiple facilities managed and operated by different supply chain actors. Accounting for network impacts on how supply chain technical complexities are described. In the limited frame of the case narrative, technical detail regarding goods transformation and the role of information in supporting the flow of goods is limited in order to also account for features of actor bonds in a wider contextual network structure, also to some degree accounting for societal features (e.g. Japanese consumer preferences regarding Norwegian fish) and natural environment (e.g. impacts of depletion of certain fish resources).

The focus in the case is placed on the product (or termed as "goods" in a supply chain context), either frozen mackerel or fresh salmon, and interactions between the product and actors, resources (including other products) and activities following the basic logic of the "ARA" model (Håknsson and Snehota 1995). This approach is complimented by developments through the NETLOG case research (Jahre et al., 2006). This contribution is then again adapted to study resource interfaces placing transformations within the flow of goods and information in focus within the scope of a supply chain from raw material to retail/restaurant (Engelseth, 2007). This empirical focus includes awareness of interactions between different actors, different types of goods and facilities, and the core flow of goods characterised as transformations time, place and form utility of products, supported by a flow of information, where information needs to be transformed to become adapted to efficiently support the flow of goods. The following case description provides a narrative organised to present issues that emerged as prominent through the brief course of this study. This includes an introductory description of the products; first *mackerel*, then *salmon*.

3. Framework

The framework provides the basic theoretical understandings guiding this investigation. A fundamental view is that individual supply chains have combined logistical and marketing purposes. Given a distinguishable purpose and definable boundaries following the supply chain flows (see Arlbjørn and Halldorsson 2002 regarding discussions of the "core" features of logistics), supply chains are viewed as entities that have variable features. In addition, these individual supply chains interact, in line with Håkansson and Persson (2004), with other supply chains in an industrial network setting. This setting, that has contextual features, is

termed here: "supply network". The approach applied in this study is influenced accordingly by aspects of 1) logistics (including SCM), 2) marketing, and 3) industrial networks (the "IMP approach"). This represents the basis for discussion of the analytical framework adapted to this study.

3.1. The Logistical Aspect

This study places an analytical focus on the physical distribution, and logistics is regarded as the core purpose in relationship to attaining efficiency and value creation objectives in supply chains distributing physical goods. This directs attention to how goods are distributed physically through logistics activities. Arlbjørn and Halldorsson (2002) argue that the "flows" in a supply chain may be regarded as the core of logistics. "Flows" is a metaphor that provides a picture of movement or goods transformations in a supply chain. Logistics, with its concern for the economics of providing goods to end users in an acceptable state, directs thereby focus to features of the flow of goods and its supporting flow of information ("logistics management" definition: www.cscmp.org) how goods are provided to end users in an economical fashion.

Logistics is accordingly regarded as the most central or "core" function of a "supply chain" entity. The mission of logistics according to Ballou, (1999 p.6), to supply "…the right goods and services to the right place, at the right time, and in the desired condition, while making the greatest contribution to the firm". Logistics, through its role as an economical function, directs supply chain actor behaviour; supply chain actors will strive to economise logistics activities in a supply chain. The question is therefore how "direct distribution" better contributes to economising logistics activities as compared to using the "traditional wholesale markets". This question has emerged based on the, through research, experienced presumptions expressed by supply chain intermediaries in interviews advocating direct distribution of fish within Japan as more efficient than the use of wholesale fish markets. This view of supply chain economy held by certain supply chain actors should, however, to be at a minimum substantiated with some empirical evidence.

In business logistics (e.g. Heskett et al., 1973), focus is placed on optimising activities from a single firm perspective. Supply chain management (SCM) is interrelated with logistics and has widened logistical research from this single-firm perspective to economising activities the scope of the entire supply chain (e.g. Lambert et al., 1998). In the case of supplying fish, this would concern how efficient activities are regarding the distribution of these goods from "sea to dish". A view is taken here that is in agreement with SCM, that logistics needs to take into account actor relationships in goods supply, meaning that economising effect of using direct distribution or traditional wholesale fish markets is approached from the perspective of multiple actors that need to coordinate different logistics activities. Each supply chain, regarded as primarily a *logistical* system, is accordingly regarded as an entity within which it is meaningful to measure logistical efficiency and value creation. A focus is directed to logistics purpose of product placement for end-consumption. This means that a total value creating effect of individual supply chains of the two different distribution modes is analysed not from the perspective of a single supply chain actor; this in line with SCM philosophy. Rather, impacts of supply chain design (direct vs. markets) on the entire scope of the supply chain are accounted for. In the supply chain each supply chain actor regarded on equal terms in relation to fish quality and safety, combined with traceability aims. SCM plays accordingly mainly an important role in this study through widening the logistical perspective of physical distribution and logistics of fish to empirically encompass a complete supply chain. This also is of importance, as previously noted, to account for food chain "peculiarities".

3.2. The Marketing Aspect

Attention is now moved to the role of marketing in supply chains; including this role in relation to logistics. Marketing is also concerned with a specific supply chain flow; namely the "flow of title" (Alderson, 1965; Heskett et al., 1973; Rosenbloom, 1995). The supply chain is viewed still as primarily a logistical system. The boundaries of this logistical system is determined by the flow of goods and supporting flow of information, dependent on forecasting and purchasing activities to direct the flow of goods. In order to support the flow of goods, information about goods must have an explicit content regarding actual or anticipated transactions. In the information flow information exchange regarding forecasts (anticipations of orders) and orders are both vital forms of information that have marketing relevance. Either logistical information is used to market products or marketing creates information used for logistics purposes. Features of the flow of goods, concerning how goods are transformed, and how this process is managed based on information in relation to the use of traditional or more direct distribution structures in the distribution of Norwegian fish to Japanese consumers should accordingly be regarded also a major marketing concern when analysing fish supply chains within Japan.

The prime objective of the "*marketing* channel" or a "supply chain" is related to goods placement in the hands on an end user in a desirable state (Alderson, 1965). Efficiency measures of goods are related primarily to technical features of the flows, how goods are transformed and provide time, place and form utility (Alderson, 1965) including the impact of information on these physical transformations. Features of supply concern both logistics and marketing business functions. "Technicality" concerns here how physical resources, products and facilities, are combined to achieve efficiency. In the flow of goods this involves the use of goods handling facilities. Regarding the flow of information, this flow concerns also how ICT (information and communications technology) is technically used in information storage and processing facilities, and how these informational facilities support the flow of goods. In a supply chain, while logistics is fundamental regarding operations of goods transforming activities in a flow, marketing through interacting with logistics provides the basis for directing this flow of goods. Marketing primarily impacts on the flow of information, dependent on technical features of information exchange, impacting directly on features of a supply chain flow of information concerning primarily managing the logistical aspects of flows of goods. Marketing may accordingly be viewed as indirectly impacting on the flow of goods. In a supply chain marketing technically interacts in the flows in an intimate manner with features of logistics. Marketing should therefore also be considered when analysing "efficiencies" or "value creation" regarding the alternative fish supply chain designs used in Japan.

3.3. The Network Aspect

Individual supply chains, are however as already indicated, only a part of the substance concerning physical distribution of goods. As Håkansson and Persson (2004) note, individual supply chain actors need to manage multiple supply chains. This feature of physical distribution in itself calls for a network approach. Individual supply chains may in addition be approached from many perspectives. Within SCM studies, a "focal firm" is commonly identified, based on a presumption that this is a "dominant actor" in the supply chain. The supply chain is accordingly then approached from this predominately actor perspective. This is logical when applying a systems approach where the aim is to manage and optimise resource use through activities from this firm's perspective. It should be noted that it is also simpler to describe system functions when taking only into account a single actor, than analysing multiple supply chain actors with potentially highly divergent and potentially conflicting aims regarding physical distribution.

From an industrial network perspective there is no notion of a dominant actor in a supply network. Attention is rather directed to interactions between interactions within and between layers of substance; 1) activities, 2) resources, and 3) actors. Such an approach provides room for investigations that may reveal new and innovative ways to combine resources through different activities carried out by actors that needing to coordinate functions (in a supply chain: mainly logistical and marketing purposes) with each other. A network is more a setting than a system, although within networks different types of systems may be identified. The supply chain is proposed as such; a fairly large system within an overall supply network. Smaller systems may be information systems, or systems for routinely transporting goods from one location to another. A system is accordingly viewed as embedded in an industrial network setting. In this setting the goods themselves and goods handling facilities, information and information processing facilities, and human resources managing and operating the flow of goods are termed as "logistics resources" (based on Penrose's (1959) classification of business resources). According to Jahre et al. (2006 p.52) logistics resources "…do not have a predetermined value, but that their value is a result of how they are used and combined with other resources". Marketing resources are regarding the same manner as logistics resources, but these mainly organisational resources (concerning in relation to supply chains capabilities related to informing about goods) interlinked with marketing business purposes where transfer of title to products in business relationship contexts represents a prime functional purpose.

From a combined SCM and network perspective, value provision and efficiency is accordingly analysed both in relation to technical features of the flow of goods, technical features of the flow of information, and how the flow of information interacts or functionally and technically supports the flow of goods in accordance with the complexity of interlinked (not necessarily highly coordinated) logistics and marketing objectives of multiple supply chain actors. This value creation takes place in a supply chain context, meaning that the supply chain with an explicit purpose of providing of goods to an end-user in a desirable state defined as a system through a description of the flow of the focal goods. "Function" or purpose is viewed as achieved through intertwined industrial marketing and logistics objectives, (from a systems approach perspective) together providing supply chain actors with *guidance* to activities transforming goods into products adapted to time, place, form utility (logistics-oriented) securing the (marketing-oriented) transfer of ownership properties. Through applying a network approach different modes of achieving value and efficiency may be considered. A network approach is therefore appropriate mode of research approach to compare direct distribution with the use of fish markets in Japan to distribute Norwegian fish. The issue of "change" is central to this study. A network may be regarded as leaning towards an "actor approach" (Gammelgaard, 2004) that encompasses analysis of features of change since resources, activities and actors are not in a network analysis bound by presuppositions regarding borders or functions of systems. From a combined approach following the "ARA-model", a network approach also encompasses how technicalities of the supply chain flows (resources and activities) interface actors managing these flows. In this picture understanding may emerge and be developed through empirically grounded analysis regarding how direct distribution and traditional fish markets may function technically and organisationally in a same supply network as independent, complimentary, or conflicting through placing analytical focus on different supply chain aspects; e.g. marketing, logistics, food safety/quality/traceability.

5. The Case

5.1 Overview

A resource-based network approach is grounded on descriptions of technical features of goods distribution; flows of goods and flows of information, and how these features interact with the actor layer consisting of organisational capabilities and actor perceptions of own ant other actor's capabilities. These descriptions are the basis for analysing efficiency and value creation through accounting for different supply network actor perspectives. Detailed descriptions of resources, activities, and actors in individual supply chains are therefore the basis for analysis.

The focal resources are the two fish products that have been studied primarily in their supply chain context thereby providing descriptions including marketing and logistics purposes. Mackerel and Salmon are the two main fish species distributed from Norway to Japan. Japan accounted for about 5% of the total fish export form Norway to Japan in December 2006. Export of *frozen* mackerel was then NOK 26 911 000 and 2178 tons in 2006, accounting for somewhat more than 32% of Norwegian frozen mackerel exports measured in value, while the export of *fresh* salmon (including head) in the same period was NOK 7 542 000 and 154 tons, accounting for somewhat less than 6 % of Norwegian fresh salmon exports measured in value (source: The Norwegian Seafood Export Council www.godfisk.no). The statistics show how mackerel is a large-volume and low-value product compared to salmon. In Japan, per capita fish consumption is among the highest in the world accounting for about 50% of the meat-poultry-fish portion of the diet.

5.2 Mackerel

These two products are from a logistical sense distinguishable from one another. Regarding production, mackerel is caught wild at sea during various seasons of the year. Especially during early autumn large quantities of mackerel are caught close to shore by large and modern fishing vessels carrying side-mounted nets. The use of nets compared to trawls reduces bruising of fish during catch. Fishing takes place close to shore. Mackerel has limited durability after catch, only 2-3 days before quality becomes decisively reduced. Therefore, fish are usually caught within one to two days in coastal waters, stored in refrigerated tanks on board the ship before returning to harbour, where the fish processing facility lies. Fish landed in the harbour located in the proximity of the fishing areas undergo industrial processing. In the case of mackerel bound for Japan mainly consists of freezing the fish round and packing into 20 kg. carton plastic lined distribution packages. A portion of the products distributed to Japan are gutted, cleaned, and cut in accordance with Japanese customer specifications prior to packing and freezing, the rest are simply frozen "round" and then packed. Fish is then stored in cold storage until transported by reefer containers on ships to Japan. About 50% of the mackerel destined for intermediary production are sent through China for processing due to lower production costs there. Processing involves gutting, cleaning and cutting fish in accordance with Japanese specifications, and then repacking into distribution packages before re-freezing the goods. Processing may also involve a light form of salting of the goods. Frozen mackerel is never displayed in retail settings. The Norwegian mackerel is sold as "fresh", meaning that distribution packaging are opened, fish are de-frozen, and packed into consumer packages labelled with best-before dates counting from the date when the distribution package was de-frozen. Through the supply chain, registrations of features of various activities influencing the goods, primarily regarding the catch and production, controls fish quality. In Japan mackerel is consumed in various ways, in home-prepared meals and in restaurants.

5.3 Salmon

Salmon is a farmed product. While the source of mackerel is comparable to hunting game, production of salmon may be described as an industrial process comparable to agriculture. The term "fish farming" is therefore widely used to describe how salmon is produced in different facilities located in the fjords of Norway. The fish farms are dependent on the supply of hatched salmon and feed. Salmon are ready for slaughter after approximately 12 to 18 months. They are transported to a fish processing facility that guts, cleans and packs in ice the fish using mainly 20 kg. distribution packaging. Norwegian salmon that is distributed to Japan is predominately a fresh product. Slaughtered fish are kept at around zero degrees Celsius, and first trucked to Gardermoen airport outside Oslo. From there, fish are transported by air to Narita Airport outside Tokyo. The chartered Aeroflot DC-10 airplane, which usually makes two trips per week for Lerøy, a Norwegian fish exporter, is met by a fleet of Japanese medium-sized trucks that distribute the fish in accordance with a fixed routing schedule covering all of Japan. Quality control of salmon is carried out through the entire supply chain, including materials delivered to the fish farms. The use of fresh and farmed salmon in Japan is dominated by restaurant use as sushi or sashimi (raw- consumption). Norwegian salmon has during the past few years become popular as an ingredient in sushi. Wild-caught salmon is not fit for raw-consumption due to the presence of parasites. Farming the salmon solves this product quality problem. At the commencement of a marketing a larger volume of salmon in Japan through the early 1990-ies, customers expressed precise requirements regarding meat colour, fat-content, and in the case of frozen products; freezing methods. Such requirements are no longer made. Rather, it is features of the price of fish combined with its freshness that is required when ordering goods.

5.4 Norwegian production of fish

The situation for mackerel and salmon production in Norway are distinct from each other. Mackerel production suffers from a large overcapacity in production facilities. This drives up the price of raw material. Fish are caught wild and sold through a sales monopoly owned by the fishing fleet. Norwegian producers then compete for the by quota-limited catch with each other. On the other hand, on a global market, Norwegian mackerel must compete with other alternative mackerel fish product-types usually offered at lower prices. Scottish fishermen use trawlers, a more cost efficient-type of catching method then the nets used by the Norwegian fishermen. However, trawls damage fish to a greater degree than nets through bruising and cuts, influencing also the durability of the fish. Norwegian mackerel is large sized having a high fat content and considered as an upscale mackerel product in the global market. The catch of mackerel has the last years been exceptionally good, but with problems regarding illegal catch by EU fishing fleets. This problem has supposedly now been controlled within the EU. Mackerel quotas are now gradually being reduced and the price of European mackerel is increasing on the world market.

Salmon is industrially farmed. Norwegian fish farming has through many years of experience become leading in aquaculture technology. Norwegian aquaculture technology also leads the way in developing fish farming of other species of fish such as cod and halibut. Norwegian technology is used as developmental aid to third world countries in South-East Asia developing fish farming of tropical species. Norwegian fish producers have also invested heavily in fish farming in Chile. Salmon farmed in Chile is today the major competitor of Norwegian salmon in Japan for raw-fish salmon consumption. The efficiency of the Norwegian salmon industry has contributed to lowering the price of salmon, widening the consumption of this product to a greater every-day usage. The low price of salmon has resulted in a number of different types of more or less open import restrictions from a range of countries, including Japan. In Japan, detailed product documentations have been administered, hampering the marketing of salmon.

5.5 The Japanese fish distribution system

In Japan fish distribution is highly regulated. In addition, licence to fish domestically is closely linked to the place of residence and is personally inherited. The import of many fish species demands import licenses, including mackerel. At present there is a surplus of Norwegian mackerel import quotas since the profitability of importing this fish product is low. Farmed Atlantic salmon is considered a "new" species, and is not subject to import regulations. Therefore, the price mechanism plays an important role in regulating this market.

When arriving in Japan, Norwegian fish are distributed through a unique Japanese distribution system. The core feature of this Japanese system is represented by the extensive use of fish markets. These markets are organized into several layers. This includes seaside markets handling catch from Japanese vessels, and wholesale markets where both domestic and import fish are traded. The wholesale markets are regional institutions, usually administered by local or regional governments. This is a physical facility providing room for the storage and display of fish, and information and banking support to facilitate transfer of title to the fish. The size of the facilities varies from the enormous Tsukiji market in Tokyo, covering several blocks of this city in its port area, to smaller facilities, that consist of a single building. In the studied smaller Morioka facility located in the Iwate prefecture north of Tokyo, the fish market shared the same building with the fruits and vegetables market. Both the Tsukiji and Morioka markets exhibit solving the same distribution function through similar types of activities. It is the size of facilities and volume of individual products that varies.

At the fish market products are displayed from early morning. Then, through a market ritual, buyers and the seller, occupying a specific area of the fish market, move from product to product to negotiate sales. Only a rapid sensory control of the goods is carried out. Japanese catch is marked on the package with the name of the species, the weight of the contents and the name of the supplier. Norwegian catch is labelled with GS1 (www.gs1.org) transport labels that include the use of bar codes. These cannot be used at the fish markets since they do not have ICT facilities for this usage. Payment in this system is settled "immediately", in practice within 1-3 days from purchase. Sales to retailers often involve credit terms delaying the payment up to 3 months.

Norwegian fresh salmon is almost exclusively distributed through fish markets. However, about 10-20% of all salmon distributed in Japan now goes through direct distribution, bypassing the wholesale markets. This figure is increasing at a slow pace. Regarding mackerel the figures are different since this fish to a higher degree is subject to production before reaching end-users. Here the approximate figures for the Japanese mackerel importer Tsujino & Co. LTD are that 40% is distributed through Japanese producers, 30% through wholesale markets, 10% direct to retailers, and 20% through wholesalers to retailers. The tendency for mackerel is like that of salmon, towards an increased use of direct distribution forms omitting the use of intermediary wholesale markets for trading purposes. The following figure illustrates the various forms of direct and traditions distribution forms Norwegian fish is subject to on the Japanese market:
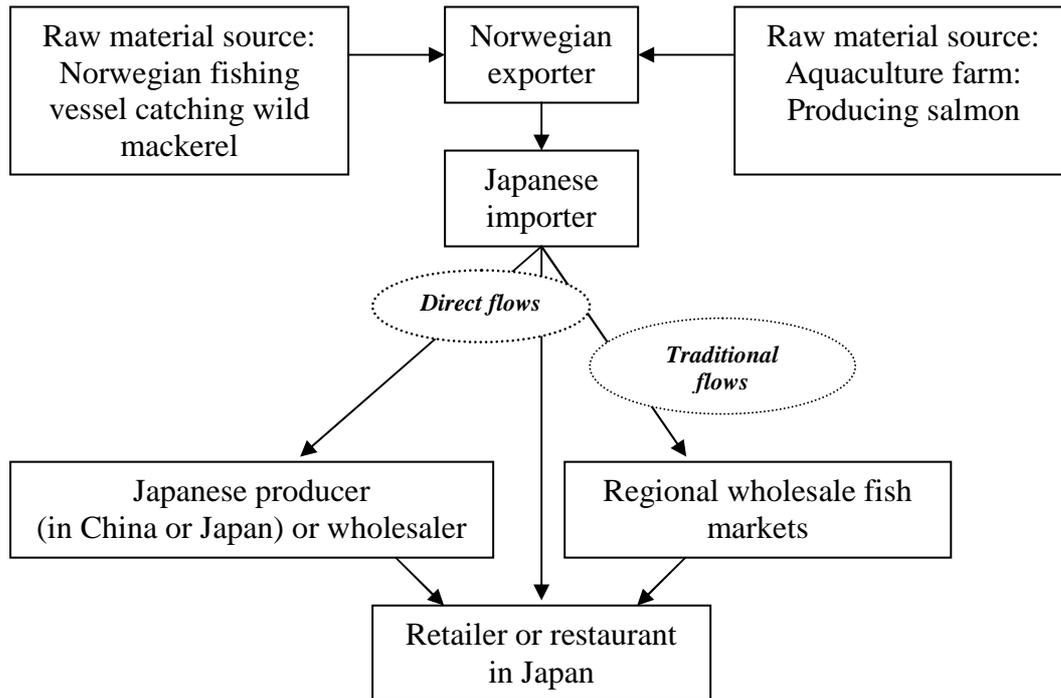
Figure: Flows of goods for mackerel or salmon from Norway to Japanese retailers or restaurants. Direct distribution systems flow fish from Japanese importers through Japanese producers, or directly from Japanese importers, to retailers or restaurants in Japan. Traditional distribution systems flow fish through fish wholesale markets.

Norwegian exporters and Japanese importers both express that they view the traditional system for the distribution of fish in Japan as inefficient. The Japanese importers do however, express the vital role which this system plays in allocating a vast number of fish species from many different suppliers, to a large number of customers. In addition, the traditional distribution system, relying on tacit capabilities for quality control, is efficient in securing high quality fresh fish to consumers. After Norwegian salmon is harvested, it takes 3-4 days before it reaches the consumer through the traditional system. There are no reports of scandals regarding the quality of fish distributed through this system. The fish markets also efficiently coordinate fluctuation sin supply with fluctuations in demand through the use of the price mechanism. On the other hand, the use of fish markets takes some time measured in hours, since the fish must be rerouted through the market facility.

The wholesale markets are traditional structures where the use of modern technology is seemingly kept at a minimum. This was evident at the studied Morioka wholesale fish market, a facility opened in May 2001. The use of ICT there was limited to accounting and financial transactions within this facility. Information exchange between actors is fundamentally manual involving the use of phone, telefax and e-mail attachments. The main criticism of the fish market is related to the price margins taken at the wholesale fish market. These margins are government regulated. However, the Japanese fish importers express that the use of the fish markets involves unnecessary use of middlemen. It is in the case of distributing frozen fish for industrial production that the use of direct distribution most developed, and it is primarily in this category, direct distribution is expected to increase at the fastest pace.

5.6 The role of other fish species in Japan

Japanese wholesale fish markets are a visual experience. Within these facilities a wide range of different, often colourful, fish species are sold. It is no wonder that the Tsukiji fish market in Tokyo ranks as one of this city's prime tourist attractions. Although Norwegian fish has a

miniscule market share measured both in value and volume, in the focal supply chains of mackerel and salmon to Japan, their market share is substantial. Mackerel and salmon also interface different fish species on the Japanese market. The Japanese started to import Norwegian mackerel when the provision of their own mackerel species was reduced during the 1990-ies. The Norwegian mackerel has a higher fat-content than the comparable Japanese pacific ocean species. The last few years the catch of Japanese mackerel has increased decisively. In addition, Japanese mackerel is priced considerably lower than Norwegian mackerel. Large quantities of frozen Japanese mackerel are therefore sold to markets in the developing world such as Africa. Japanese consumers seem to prefer the Norwegian mackerel to the Japanese, though this issue needs to be further investigated. Japanese customers may also purchase low-priced mackerel from other sources, though the quality is not directly comparable. One Japanese informant questioned why he should purchase Norwegian mackerel, when he could purchase mackerel from Tasmania for half the price.

Fresh Norwegian salmon competes primarily on the "fish for raw-consumption" market in Japan. Here the main competing species is Tuna. With the diminishing catch of tuna, prices of this species has over the past years increased considerably, and with the issue of a strict quota system, tuna will in the foreseeable future increase in price, while the price of Norwegian Atlantic farmed salmon is not expected to change dramatically. Fresh Norwegian salmon may then moreover become more competitive with tuna in the up-scale fresh fish retail market, where tuna now has an almost completely dominant position concerning volume of trade. On the other hand, frozen salmon, imported from Chile, is now used mainly for other purposes than raw-consumption may in the future pose a threat in the raw-fish consumption market segment. This is because this type of fish is useable for this form of consumption since it also is a farmed product. An interesting aspect of this situation is that Norwegian salmon producers hold an important stake in Chilean salmon production. In addition, as previously noted, Japanese consumers do not precisely distinguish between "fresh" and "frozen" fish products.

5.7 Actor interfaces in a globalising fish market

There is a great diversity of various types of actors involved in distributing both frozen mackerel and fresh salmon from Norway to Japan. Core actors in the supply chain include fishing vessels or aquaculture farms, producers in Norway, producers in China or Japan, traders in Norway and Japan, Japanese wholesalers, Japanese fish markets, Japanese retailers or restaurants, and a range of different types of logistics service providers. Compared to the Japanese distribution system, the upstream actors are larger and more industrialised. Norwegian producers and exporters use to a higher degree ICT (information and communications technology) to support information exchange between them. This involves the use of advanced transport labelling that contain bar codes for automated goods identification. Japanese importers to not make use of this Norwegian capability for automated information exchange due to lacking investments in ICT-based capabilities to automatically read labels.

A distinct feature of the studied supply chains are that supplier-customer actor interfaces between Japan and Norway are well developed. Formalised agreements including the use of written contracts is limited in these supply chains. Contracts may be written, and used for guidance, but are normally never signed. Actor bonds in these supply chains are tight, with good personal relations. Both in relation to the trading of mackerel and the trading of salmon, Japanese importers often send representatives for prolonged stays in Norway. In the case of mackerel production and trading by Global Fish in the Ålesund area of North-Western Norway, representatives of 7 large and 5 smaller fish importers are seasonally present at this location, approximately 25 Japanese representatives in all. They carry out quality control, and negotiate portions of the production to be allocated to the different importers. On the other hand the Global Fish marketing manager travels several times a year to Japan to meet

different customers. In the case of the export of fresh salmon, there are 5 large Norwegian exporters holding approximately a 70% market share. Of these, Lerøy has two liaison officers in Toyo, Marine harvest has established its own import company with a developed distribution network, Pan Fish has established an import firm with partial Japanese ownership after failing to establish its own distribution network, while Coast Seafood has chosen to handle all its relations with Japanese importers from Norway. The success of Marine Harvest is normally attributed to the long-term efforts on the Japanese market of this actor. Since entering the Japanese market in the 1970-ies, they have patiently and in a strategically driven manner developed a direct form of distribution system though at times was unprofitable.

A main subject of some dispute in these chains is related to setting the price of goods through negotiations. Norwegian producers express a wish for greater predictability both in relation to purchasing raw material through the sales monopoly, and in relations with their customers. The Japanese customers therefore express seeking the lowest possible price to remain competitive. Japanese importers, at current especially importers of mackerel, are squeezed between Norwegian producers marketing fish globally and Japanese retailers pressured by Japanese consumers that increasingly choose to forfeit quality and rather choose to purchase cheaper fish for their meals. There is therefore some degree of tension in the mackerel chain since the import of Norwegian mackerel to Japan at present is hardly profitable to the Japanese importers. In addition, the Japanese importers feel obliged to secure continuous deliveries of Norwegian mackerel to their customers at "reasonable" prices. This reflects a vital aspect of the Japanese distribution system, the willingness to secure long-term business relationships even if they may in the short-term be unprofitable. Recently several Norwegian pelagic fish producers have merged into one firm, Norway Pelagic, to counter low profitability in their industrial sector.

5.8 Information and traceability of fish on the Japanese market

Traceability requirements regarding fish products are in Japan limited to documenting the country of origin. In practice, this rule is through government-administered intermittent goods controls, found to be broken. Mackerel from other countries-of-origin has been detected as repacked labelled as "Norwegian" mackerel in Korea. Foreign oysters have been detected packed as "Japanese" in Japan. Counterfeit labelling is a widespread and obscure problem in the supply chain of fish destined to Japan, where products considered of low value are marked as higher-value products, primarily associated with the country of origin. Authenticating origins of goods is regarded an integrated aim of a traceability system.

While EU regulations now demand full internal and chain traceability of food products, such formal measures only exist for oysters and beef in Japan, two products that have been subject to food scandals that had impact on Japanese consumer health and welfare. Full chain traceability of Norwegian fish is lost when moving through the traditional fish-market distribution system, since this market form does not identify in a formalised manner where documents and goods may be accurately compared, and therefore also does not accurately record goods transformations when goods identification are transformed into information used within information systems. Salmon and mackerel may be accurately traced given that they remain packed and labelled. Fish production is internally registered both on China and Japan, and these records are accessible upon demand.

A key feature of fish product traceability in the supply chain of Norwegian fish to Japan is that this capability is at present not highly demanded by consumers or professional actors in the supply chain. The implementation seems at present to play the role of a formal courtesy gesture rather than represent a need to sustain food quality and safety. Japanese fish importers are aware that this perception of fish traceability presumably will change in Japan the coming 10 years. If a fish scandal occurs, this should expectedly increase the speed of implementing

fish traceability legislation in Japan, providing regulations comparable to those imposed in most other developed nations of the world.

Another feature of product traceability in the supply chain of fish from Norway to Japan is that each actor holds "private" records regarding the transformation of goods in the leg of the supply chain they are responsible for operating. These records are poorly interconnected creating a supply chain that may be described as islands of information that may involve the use of advanced ICT. These "islands" are, however, interconnected with relatively primitive forms of basically manual communication such as fax, phone and e-mail attachments.

6. Main Findings

The following discussion reflects based on the rather limited case empirical material how efficiency may be discussed when comparing distribution of Norwegian fish to Japanese end-users through either direct channels or through wholesale fish markets. When analysing the technical features of flows of information supporting a flow of goods in the individual supply chains, the following discussion reveals there is no basis for evaluating the one form of distribution as more efficient than the other. Distributing fish is far too complex to provide clear-cut "truths" concerning optimal distribution solutions on the Japanese market. The safety and quality of the fish goods seem to be treated likewise through both types of supply chians, although fish markets lack competence in documenting fish quality by not having product traceability systems. Concerning economising supply chain activities, it seems, however that direct distribution is advantageous mainly when ordering and then distributing large shipments unified goods. Wholesale fish markets are better equipped to handle trading between numerous small sellers and purchasers. Wholesale fish markets may also develop more efficient routines for information processing and exchange, thereby also satisfying traceability demands, when these eventually emerge.

The potential demise of the tradition distribution structure of fish in Japan is accordingly viewed as not clear-cut, although it is fair to say that this form of fish distribution is under threat. The threat to traditional distribution is primarily registered as actor perceptions in specific individual business relationships that may profit from increased use of direct distribution of Norwegian fish. Wholesale fish markets should play an important role in fish distribution in Japan in the foreseeable future due to the large amount of types of fish distributed in relatively small quantities with high quality to different fish purchasers. The Norwegian fish will continue to play a minor role of this scenario. This role is of importance in the studied market segments of salmon and mackerel products. A growing importance of direct distribution will expectedly take place hand-in-hand with changes in the structure of distributing fish in general in Japan. As more and more fish are distributed through retail and restaurant chains, the importance of direct distribution will grow. This is however dependent on that direct distribution can provide a quality grade and diversity of product types of fish that Japanese consumers demand.

The demise of the Japanese wholesale fish markets is only possibly foreseeable in a long-term perspective. This slow trend that may be inhibited by the fish wholesale markets revitalising themselves through measures to cut costs through more efficient goods handling and information exchange in using these markets given the growing competition from direct distribution. Further investigations are called for to better substantiate the impressions provided in the following discussion that starts by analysing the core flow of goods in the supply chain. This discussion is followed by the role of information exchange supporting the flow of goods. After this features of managing the supply chain are discussed, followed by the role of track and trace, and finally features of marketing are accounted for. This discussion interweaves the issue of channelling goods either through "traditional" wholesale fish markets in Japan or using the more "modernistic" direct distribution mode.

7. Discussion

7.1 Technical layer: Provision of goods

The "provision of goods" indicates the core logistical purpose of the studied supply chain. This accounts for aspects of operating a *flow of goods* involving analysis of efficiency in distributing fish from Norway to Japan by considering the technical features of transforming the time, place and form utility of these goods (Alderson, 1965). A prime aspect of this goods transformation is that these are physical entities. They may therefore at a specific time or time interval, be described as having specific place and form features. Physical distribution follows a logic of inter-organisational dependencies, that in accordance with Thompson (1967), may be described as sequential given the core role of the flow of goods in these relations. This form of dependency is significant in physical distribution including fish production and distribution. In fish supply chains value creation is dependent on efficient coordination of sequential logistics activities that transform goods through a flow managed by different supply chain actors. In the network setting embedding the technical aspects of flows of goods and interacting flows of information, business relationships between actors are not equally sequential. In this wider network setting actors may be driven by motivations other than securing efficiency in sequential dependencies of a chosen "focal" supply chain, such. This problem is here, not studied in greater detail. However, when a Japanese fish importer also distributes fish produced in Norway within Europe, features of these business relationships will impact on business relationships dedicated, from the perspective of the Japanese importer, to importing Norwegian fish to Japan.

Activities that transform the logistical features of the fish may be classified as transport, storage, production or materials handling, where materials handling plays a key role in interconnecting the three other activities: transport, storage and/or production (Engelseth 2007). When fresh mackerel are landed at port for production, goods must be handled before entering production. Likewise, when salmon arrives from air transport at Narita airport in Tokyo, it must be handled at a terminal facility before being trucked to different distribution centres, the wholesale fish markets, geographically spread around at different locations in Japan. Marketing plays a supporting role in this quest to supply goods, by providing the basis for creating orders. Placing focus on the technical aspects of distributing the fish, these serially organised logistics activities, may be described as independently accountable and moreover may be described and analysed in relation to each other.

Analysing the efficiency or value creation within the logistical supply of fish involves measuring technical features regarding time, place and form of the fish in relation to logistics objectives. Since fish is a food product, quality and safety features of these goods are of prime importance. Quality is regarded as primarily a business feature of products, while safety directs attention to societal needs regarding products. Time has decisive impact on the freshness of food products impacting on both safety and quality of fish. Production features, such as packing and freezing, reduce the impact of time, prolonging the durability of the goods. Efficiency of goods provision may be regarded primarily in relation to the form features of goods measured as its degree of freshness and security from contamination. Therefore, location and time are used describe how well the fish are distributed to Japan in relation to the quality and safety of the fish. Since logistics is an economic activity this involves also accounting for the cost of the use of facilities and human resources in achieving the quality provision of these goods. There is therefore a compromise between attaining fish quality and the efficient use of logistics resources since achieving the highest quality also means potentially increasing logistics costs that contribute to reduce the impact of time on the fish.

In the case of fresh salmon, the relatively costly form of air transport is used to secure the freshness of the product. Moreover, the entire supply chain needs to be coordinated to achieve

the reduction in waste of time to secure freshness. This omits in practical terms the use of storage in this supply chain. In the case of mackerel, distribution is comparable to salmon in the upstream part of the chain, prior to production. However, after freezing these goods, storage may be used. Freezing goods permits also the use of slower and less costly form of container transport by ship. This is substantiated in differences in delivery times. While fresh salmon takes only about five days from harvest until delivery to restaurants or retailers in Japan, the time frame of mackerel supply is measured in months after production.

The use of fish wholesale markets in Japan involves some time usage measured in a number of hours since fish are required to be physically located at the market for inspection upon trading. This rule is in the process of being abandoned in the case of the Japanese seaside markets located at Japanese ports. Moreover, when purchasing mackerel in Norway this involves physical inspection only after purchase upon arrival of the goods at the Norwegian production facility. Delivery of inferior quality may lead to further negotiations regarding price reductions. The added logistics costs of using Japanese wholesale fish markets involves fees for the use of this facility, the extra cost of routing transport through these facilities, including materials handling at these facilities. Japanese importers and Norwegian exporters note that the main cost of fish is the cost of using an extra intermediary. This intermediary demands a mark-up in the price of the goods, which later is reflected in the total cost to the end-user. The main advantage of omitting the wholesale fish markets is to jump this "middleman" (the Japanese wholesale fish market) and the costs created by this supposedly excess supply chain intermediary.

Mackerel and salmon are controlled in similar fashions by applying sequentially organised goods inspections in accordance with plans through the supply chain. Since salmon is a farmed product, this means that the features of production and use of feed at the farming facilities also need to be controlled. At Japanese fish markets no formalised routines for quality control exist. Fish quality is, however, highly valued, and rigorously secured through sensory control. This quality control activity is based skills acquired through years of practice in the fish distribution business. This is a form of tacit knowledge, a skill that according to Polanyi (1966) is difficult to describe in an explicit manner. These skills are therefore obscure to "exact research" since measuring skills concerns an object abiding in the human mind. This tacit quality control system exposes, however, in practice efficiency in assessing the freshness and other form features of the fish. Quality control is of economic importance since form (or physical quality) features of fish together with the volume balance between supply and demand determine the price of the fish in a market where multiple fish purchasers simultaneously control varieties of fish in a similar manner. On the other hand, through direct distribution, fish control is dependent on the use of established more formalised control routines. This more explicit form of control, based on written rules, provides quality control of fish, of importance when trading fish including sales to end-users. The markets on the other hand are a social setting that can be described as having a "fish market culture". Direct distribution involves a form of quality control that is more instrumental, where rules provide the primary guidance in securing the quality and safety of the fish, and quality control of fish is measurable in relation to written documents providing information about quality standards.

The case study exhibits that both the use of wholesale fish markets and direct distribution succeed in supplying fish from Norway to Japan in accordance with time, place and form objectives of product supply. Direct distribution and the use of wholesale fish markets in Japan therefore both sufficiently secure goods safety and quality supply objectives, though this is achieved through very different types of explicit and formalised goods control processes. The case data, however, does not provided sufficient basis for evaluating in detail the costs of direct distribution compared to use of traditional channels in distributing fish from Norway to Japan.

7.2 Information Exchange

Information exchange is regarded as the glue that bonds actors in a supply chain with the prime purpose of managing technical flows of goods. In relation to flows of goods, Alderson (1965) argues for a need for a decision-making event to coordinate a preceding activity with a following activity transforming goods. This intermediary decision-making activity in a supply is termed by Alderson (1965) as a "sort". After a goods transforming activity (transport, storage, production or materials handling), goods are *controlled*, and prior to an activity, goods are *assigned* to another following goods transforming activity. The sort concerns accordingly both assignments of goods and controlling goods by supply chain and is carried out by supply chain actors. These sorts are again based on plans and objectives for transforming goods, features of information flow supporting flows of goods. Within business logistics (Heskett et al., 1973), with its single firm focus, information is primarily viewed as playing the role of directing the flow of goods through assignments. However, when treating multiple actors on equal terms in studied fish supply chains an alternative picture of information flows in a supply chain context evolves.

Gadde and Håkansson (2001) consider the important role information exchange between actors plays in supporting logistics. While goods are transformed sequentially, information needs to communicated based on another logic of dependency. This communication may proceed in both directions (Gadde and Håkansson, 2001), and therefore has reciprocal properties (when communicating in real-time/simultaneously) and pooled properties regarding combining different types of information content (e.g. inventory lists, production plans, transport routing schedules, goods identification and control documents, personnel work lists, orders, invoices) resources into new information adapted to use (see: Engelseth, 2007; Thompson, 1967). In addition the linkage of the flow of goods with the flow of information has another peculiarity since goods are transformed through the supply chain. When describing goods, information concerning goods must be updated, and this information is registered during control activities, during or after logistics or production activities. The flow of goods accordingly also impacts, as Engelseth (2007) notes, on the flow of information. Information should therefore, especially compared to the physical goods that are location-specific, be regarded as a resource that may be developed to have highly flexible properties.

After an activity, goods are therefore not only controlled, but this information content contributes to sequentially transforming the properties of information about goods when controlling goods. While activities in the flow of goods are evidently sequentially dependent on each other, within the entity termed within logistics as the "flow of information", other types of dependencies than sequential ones are evident. Therefore when considering the efficiency of direct distribution as compared to the use of traditional wholesale markets, features of efficiency regarding informational dependencies impacting on how well information is transformed for use should be considered. In addition, information may easily be communicated for use by actors contingent or independent to a focal supply chain. This especially the case when considering product traceability concerning informing about detailed product features, e.g. to government control organisations or actors concerned with features of fish distribution such as depletion of fish resources in the sea.

In this respect an important aspect of increasing efficiency of information exchange in the supply chain are the costs of using ICT (information and communications technology). ICT represents a substantial investment. In addition, implementing ICT is prone to inefficiencies. User friendliness of ICT may be problematic in business practice. Decision-makers in supply chains often feel as one logistics manager stated, "...swamped in information but starved of data..." (Popp, 2000). In a study of implementing ICT solutions for SCM Auramo et al. (2005) found that "...benefits are overlapping and interlinked." When using "state-of-the-art" ICT, this type of media also provides an abundance of information in an economical manner.

Sometimes logistics decision makers have to deal with the problem of navigating through too many documents provided by an information system (Gadde and Håkansson, 2001). Ellram et al. (1999) discuss that "…much of information technology in use today has been implemented in a piecemeal fashion, and is not directly connected to other internal or external systems". Further that "IC&T's supporting the various activities of supply network process are diverse and disconnected…", and that ICT needs to a greater degree to "… shift from 'local optimisation' to 'supply network optimisation'" (Romano, 2003). Many of these problems regarding the use of ICT in achieving information exchange efficiency are prevalent in the studied fish supply chains from Norway to Japan.

At the different sorts, dependent on information provision to make decisions, the *efficiency regarding information exchange* to distribute fish should be taken into account. This involves from a technical aspect how well the different information systems are interconnected. This technical perspective also involves how well information registered through a combination of goods control and plans is adapted for logistical use to assign goods to logistics activities, and information about goods needs also to be transformed (adapted) to secure marketing objectives. The supply chain actors consist of e.g. raw materials suppliers (fishing vessels including the sales monopolies and fish farms), producers in Norway, producers in Japan or China, exporters in Norway, distributors including markets in Japan, retailers and restaurants in Japan, and the many different logistics service providers. Each actor in the supply chain operates individual information systems. How these information systems are interconnected impacts on information exchange efficiency. Efficiency should be analysed in relation to costs of using ICT in combination with actor perceptions of usefulness of applied systems to support the efficiency/value creation in a flow of goods. In addition, the transformation of information content adapted to various types of use must be accounted for in order to evaluate the efficiency of information exchange. Information about goods must be transformed in order to update information about sequentially transformed goods and to be adapted to differences in actor needs. The informational needs concerning features of goods of a Japanese retailer or importer differ form the needs of Norwegian fisherman or producer, or then again a logistics service provider operating in a global marketplace for logistics services.

Practice regarding information exchange, efficiency of information connectivity, is evidently a dismal encounter when approaching the studied fish supply chains. Actors in the focal fish supply chains from Norway to Japan are weakly interlinked at almost all stages in the supply chain. For instance, information exchange between actors in characterised by the use of manual communication. The telephone is used to create orders and documents are sent by fax or as e-ail attachments to support logistics activities. Especially the production facilities are supported by advanced ERP (enterprise resource planning) systems. Logistics service providers, especially those responsible for transport from Norway to Japan use advanced ICT to support their operations. From a single firm perspective, information processing is seemingly efficient. However, when taking into consideration the role of information exchange between actors in supply chains, the noted "islands of information" emerge through analysis that are weakly linked with each other. In addition, the weak interlinking of supply chain actors impacts on the transformation of information content between supply chain actors. Information exchange is limited to standardised and routine exchanges of information such as transport and order documents. More detailed information content concerning goods is exchanged by phone, and this type of information is rarely registered in detail. Manual forms of communication involve simplifying information handling procedures. Information content detail or complexity is sought reduced since manual communication forms do not allow for waste of human resource use in information exchange. This simplification of information exchange in the fish supply chains impacts on product traceability rendering it a manual activity that is dependent on the availability of key human resources when this information intermittently is demanded.

When comparing information exchange in direct distribution of fish from Norway in Japan with information exchange in relation to the use of wholesale fish markets, the picture regarding information exchange is mainly the same for either using direct distribution or fish markets within Japan to distribute Norwegian fish. Direct distribution should be expected to lead to greater efficiency in information exchange through the use of electronic documents automating the interlinking of at least two information systems used by different actors. This is however not the case. Regarding information exchange efficiency, one channel may not, based on the provided case data be judged as more efficient than the other. It is in addition equally possible to automate information processing within a fish market as it is to automate information processing in a firm. It is therefore also equally possible create electronic linkages between information processed at fish markets, where supply chain actors meet to trade, and other supply chain actors, as it is with to create electronic information exchange between different supply chain actors not using fish markets to trade. Finally, there is the question regarding whether the use of electronic information exchange actually will contribute to more efficiently support of logistics activities (flow of goods) and business-to-business marketing activities concerning physical distribution. The total costs of transforming goods and transforming information must then be taken into account. Efficiency gained through investments in ICT and electronic interconnecting supply chain actors must be substantiated in total efficiency measures for all vital business processes in the supply chain.

Information exchange at fish markets should expectedly to higher degree become dependent on flexible informational resources than those used in direct distribution. At fish markets a high degree of complexity in trading is evident. Numerous actors trade a wide range of different fish products. Since a fish market depends on the use of switching trading between different trading partners, efficiency in information exchange will rely on the use of common information standards used by all participating actors at Japanese wholesale fish markets. At present standardisation is limited to terminology used in negotiations and fixed sales documents embedded in a culture regarding procedures for trading fish daily. These fish markets may be regarded as an individual supply chain actor, and not only as a facility for trading goods. A wholesale fish market, regarded as an individual supply chain may as a system in the immediate context of a supply chain and wider industrial supply network, develop internal information systems to carry out its market activities, and link this information through exchange processes information systems of actors using the fish markets.

Accurately measuring supply chain efficiency is a complex research endeavour since it involves gaining access to detailed cost and income data in a series of supply chain actors, and analysing this data in a holistic supply chain perspective. This analysis therefore barely scratches the surface of problems economising information exchange in a supply chain. This preliminary analysis, however, does not provide foundation for judging that information exchange through the use of fish markets should be less efficient than when using direct distribution. It only indicates that implementing electronic information exchange may possibly be somewhat simpler in direct distribution since information exchange here takes place in the context of a definable single or limited number of business relationships, as opposed to markets where business relationships are used with the purpose to handle switching trade between alternative established relationships.

7.3 Logistics Management and Marketing Management in Supply Networks

The preceding analysis has mainly dealt with the technical features of the flow of goods, the flow of information and how they are interrelated, and how this is of relevance in relation to direct distribution or the use of intermediary markets. The next step involves directing attention to the managerial aspect of supply chains. This concerns how either the use of fish markets or direct distribution may impact on the efficiency of managing the studied fish supply chains from Norway to Japan. Principles of logistics integrated with supply chain management may here be reflected on in this part of the analysis. This means that the

management scope concerns the entire supply chain rather than the supply chain from the perspective of a chosen "focal" actor. An important feature of supply chain management philosophy is creating efficiency from a holistic perspective of the supply chain through integrating supply chain actors (Lambert et al., 1998). This view increases in complexity when taking into account that a supply chain actor in many cases is responsible for managing the flow of goods in multiple supply chains (Håkansson and Persson, 2004). Therefore, network perspective should be called for where a logistical network (Jahre et al., 2006) represents the immediate context of flows of goods. Returning to the supply chain viewed as a system, an important aspect of supplying both salmon and mackerel to Japan is the need to coordinate different sequentially organised activities. Information exchange provides the basis for efficiently carrying out sorts (Alderson, 1965) that are adapted to previous and following sorts.

An important feature in the studied fish supply chains is variations in the volume and form features of the goods in different legs of the flow of goods. Upstream, both the flow of mackerel and salmon are characterised by substantial quantities of the same type of goods being handled as a single unit. Salmon and mackerel are sourced from different suppliers to a facility where goods are packed, and then transported as a uniform entity to Japan, either through airfreight, or in a reefer (cold storage) container. The dual marketing and logistics challenge emerges after the goods arrive in Japan. Here goods need to be allocated to satisfy consumer needs in this entire island nation. It is only producers (fish factories), either in Japan or China (producing for the Japanese market) that receive large quantities of goods from a single shipments. The individual supply chain is with difficulty described as a clearly linear "chain". The chain is a metaphor, and the question arises regarding the appropriate usefulness of this picture when analysing supply chains. Rather, the supply chain resembles what happens when one cuts a telephone wire at both ends, revealing multiple smaller wires enclosed within it. In the case of distributing fish from Norway to Japan, the central part of the wire may be used to describe the part of the flow of goods between Norwegian exporters and Japanese importers. This picture resembles the case of fish distribution through Japanese wholesale fish markets from the perspective of the market. This is illustrated in the following fig. 2:
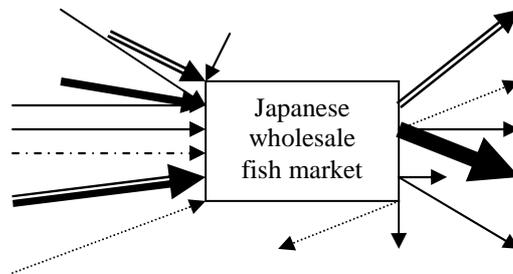

Fig. 2: Multiple flows of goods interacting at Japanese wholesale fish markets

The aspect of supply chain actors managing multiple supply chains is of importance when seeking to judge whether the use of direct distribution is "more efficient" than the use of wholesale fish markets. The Japanese wholesale fish market is an organisation that is specialised for handling many different types of physical goods and transforming these into new units based on transactions that have taken place at the market. The fish market is in this sense flexible since it can handle variations in types of goods, and is relatively indifferent to moderate fluctuations in the volume of the goods. These markets are specialised for handling complex goods movements and product ownership transactions. Fish markets are especially convenient for small fish purchasers, who thereby gain efficient contact with suppliers. Another aspect of fish markets is that this also is the foundation for more the economical functioning small-scale distributors. This middleman function may represent an unnecessary cost-increasing aspect of using wholesale fish markets in Japan. On the other hand, these fish

markets are well adapted to efficiently supplying goods to a current structure of numerous small independent Japanese retailers and restaurants.

It is relatively difficult to conceive how direct distribution from a Japanese fish wholesaler to its many small customers in principle terms should be more efficient than using the current fish markets. It is in this picture very important to note how current Japanese fish markets efficiently control and secure fish quality and safety though predominately manual and professional-culture embedded management procedures. A risk involved in direct distribution is that a wholesaler may not efficiently coordinate supply with demand. This concerns primarily fresh fish that may not be stored due to its perishability. Furthermore, the market also may be regarded as a scene for supply chain integration since actor bonds are developed within markets since actors are present at the daily trading process. It is reasonable to judge that the use of direct distribution will be limited to transactions involving large volumes of fish, for instance when fish are sold by Norwegian exporters to Japanese producers, that again may market consumer packed products wit prolonged durability directly to retailers. Moreover, fish having prolonged durability provided through production, should be better adapted to direct distribution since this reduces the risk of discrepancies in matching fluctuations in supply of Norwegian fish raw material with fluctuations in consumer demand in the downstream "Japanese part" of these fish supply chains. Direct distribution and wholesale fish markets coexist at present. Focusing on the impact of time limitations concerning product features, fish products may seemingly be better adapted to distribution through flexible fish markets, while frozen fish that may be stored, may be better adapted to direct distribution. In addition large volumes of fish are possibly more efficiently traded through direct distribution.

Features of the transfer of title are impacted by direct distribution or the use of wholesale fish markets in Japan. Direct distribution involves the use of sets of business relationships between purchasers, sellers and logistics service providers. This is illustrated in figure 3 below:
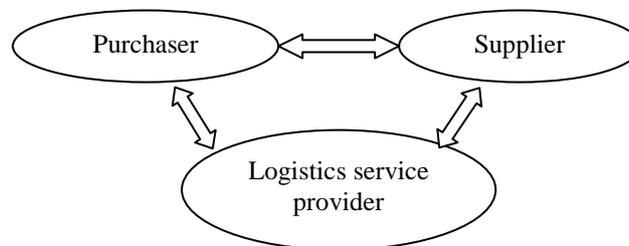

Fig.3. Direct distribution characterised as a set of business relationships. Double-headed arrows indicate information exchange.

While wholesale markets are more appropriately described by characterising flows of goods, direct distribution substantiates a greater focus on business relationships. This distinction is mainly due to the greater complexity of fish markets regarding the number of product types handled and the number of actors involved in these markets. Håkansson (1982) describes how business relationships are characterised by repeated transactions that change primarily in a more long-term perspective. There is a qualitative aspect of business relationships, the more developed, the more complex. Accordingly, complexity regarding direct distribution concerns primarily complexities within business relationships, and how business relationships are interrelated in this form of supply chains. In the studied fish markets, complexity regarding the number of business relationships directs analytical focus at this stage of research to the structure of business relationships rather than detailed aspects of their inner workings. Sets of actors prefer to do business with other actors they have developed actor bonds with. The use

of direct distribution should reflect features of the core business relationships of such a supply chain thereby potentially contributing to stability in transactions. Stability in business relationships should also increase predictability of the flow of goods since ordering is transformed more into a series of recurring and relatively similar events (involving sets of actions). More or less standard volumes of goods are purchased from fish suppliers that in practice are mainly Japanese importers. The Japanese fish importers rely on their customers, the Japanese retailers and restaurants interfacing the end-user. In this seemingly stable scenario one must take into account features of the flows of goods. When considering the impact of the flow of goods on the transfer of title, the supply chains of mackerel and salmon are clearly distinct from each other. In the case of both salmon and mackerel there are no great variations in the supply of goods. Salmon is a farmed product, where production may be to some degree adapted to demand. Unsold fresh salmon may also be frozen. Mackerel is a seasonal product that is quota regulated providing a predictable annual volume of the catch. However, when freezing both salmon and mackerel, this serves as a buffer between variations in supply and demand. It is, therefore, not variations in supply of goods that primarily impact on uncertainties regarding price. The main impact is that of how both these fish products are marketed globally. Fish prices may therefore fluctuate dependent on relations between the different chains on a world market for fish products.

The cases depict how Japan is losing in the competition for purchasing especially mackerel products. The problem with direct distribution is that the long-term character with regulated prices does not take into account fluctuations in the global market price of the fish. A long-term agreement for direct distribution of fish involves the risk of economic loss in the case of price variations. Cost reductions achieved through direct distribution should be weighed against this risk. Finally, variations in demand also impact on market price of the fish, and this demand is influenced by how consumers switch between alternative fish products. Demand variations in fresh fast moving consumer goods are small (Engelseth 2007). These are low-priced items that consumers purchase on a regular basis, and show some fluctuations between the day of the week and the seasons of the year (Engelseth 2007). It is mainly the price of alternative fish products, such as tuna in comparison with fresh salmon, and Japanese mackerel in comparison with Norwegian mackerel, that impact on demand for fresh Norwegian salmon, and frozen Norwegian mackerel by Japanese retailers or restaurants.

The use of wholesale fish markets is the traditional manner to solve the problem of coordinating variations in supply with variations in demand and adjustment to competing food (primarily other fish species) products. The core adjusting resource used at markets is price. Using the price mechanism to transfer the title of the fish at Japanese wholesale markets involves trading within constraints of formal regulations concerning trading practice. This involves the demand that purchaser, sellers and the fish be present when they are traded, and that the price mark-up is regulated to a fixed percentage. Japanese government authorities that own and run these markets control fish trading. The main feature of using markets is that they depend on the learned skills of the actors taking part in the trading process. Trading through the market is mainly a manual process, and most documents are created manually. Efficient trading in the market is therefore dependent on tacit knowledge, while direct distribution does not rely on traders equally proficient in combined trading and goods quality evaluating skills. The Japanese wholesale fish markets, as they are currently organised, are accordingly efficient as an arena for trading fish dependent on the proficiency of the actors carrying these trading activities. Fish markets efficiently coordinate fluctuations in supply and demand volume. However, through using the price mechanism as the main regulator, this will also reduce the predictability of prices in retail and restaurants. In practice, this form of price predictability is highly valued. In the case of distribution frozen mackerel, the cost of high prices of imported mackerel has been suffered mainly by Japanese importers who have chosen to sell these goods at a loss both through direct distribution and through the wholesale fish markets.

Supplying mackerel and salmon to Japanese consumers is carried out in a wide distribution network consisting of multiple mackerel, salmon, and other fish product supply chains. The nature of these supply chains is changing through pressures form the network consisting of multiple, often competing supply chains. In addition environmental and societal contingencies impact on the overall networks, also impacting on the individual supply chains. In a network setting actors need to take into account both managing a "focal" supply chains in accordance with marketing and logistics aims. In addition, managing one supply chain needs to take into account managing other supply chains. In this scenario, direct distribution may be chosen for one supply chain and traditional distribution through fish wholesale markets for another supply chain by a same actor. Over a more long term, actors express intent to move a greater volume of goods to direct distribution. However, this movement is dependent on the impact of common environmental and societal features and regarding how individual supply chains organise distribution from raw-material to consumer regarding. From this perspective, both direct distribution and traditional wholesale market distribution may be developed through alternative modes of resource combining involving both impacts on the flow of goods and features of information exchange in the overall supply network supporting the flow of goods, and use for other business and wider societal purposes. Technicalities of flows of goods and flows of information must also be analysed in greater degree in relation to achieving combined marketing and logistics aims in supply chains.

7.4 Informing to secure Safety and Quality: Tracking Goods and Tracing Products

This part places focus on informing about goods in relation to the overall aim of a food supply chain to sustain the provision of safe and quality products to end-users. An important aspect of information exchange in food supply chains is the increasing demand for product traceability. Traceability is in accordance with ISO 8402:1994 standards defined as "…the ability to trace the history, application, or location of an entity by means of recorded information." The EU General Food Law Regulation (178/2002, article 18) defines food product traceability as the ability to trace and follow a food, feed, food-producing animal or substance through all stages of production, processing, and distribution. Securing food product traceability involves according to the UK-based government Food Standards Agency 2002 report issues regarding 1) products (the physical properties of the goods and their transformation in a supply chain), 2) the data (information concerning these goods), 3) calibration (regarding information exchange), 4) IT and programming (regarding the design and use on an information system to facilitate food product traceability). Tracing products is concerned with providing detailed information regarding the history of the product in the supply chain through information exchange while tracking goods is concerned with information exchange to provide information concerning the current location of goods.

Tracking goods and tracing products are different and independent information gathering activities carried out in a supply chain. These activities are closely interlinked (Engelseth, 2007). Tracing products is often associated with the detection of product discrepancies detected through goods control. Tracing products provides thereby information to help supply chain actors learn how to in the future to avoid recurrences in product failures, ranging form in the worst cases food contamination to minor cosmetic discrepancies in packaging. If a need emerges to recall goods, tracking goods provides goods control information that is the basis for operating a goods recall process.

Tracking goods and tracing products use the same information base. Both activities involve searching form already information registered through control of goods, information that was registered in relation to logistics and production activities. The ability to track and trace is dependent on information exchange, since the information sought is usually located in the information system of at least one other supply chain actor. It is therefore meaningful to describe the product traceability and the ability to track goods as supply chain capabilities (Engelseth, 2007b).

While the EU has strict regulations concerning food product traceability, traceability requirements are in Japan limited to oysters and beef. The ability to trace fish products is therefore in most cases voluntary in Japan. In practice the need to trace products is usually linked with failure in materials or product control. The need to trace fish is intermittent and actual tracing of food products is in many cases rarely carried out (Engelseth, 2007). In Japan no food poisoning scandals from fish have occurred. Traceability in Japan is mainly concerned with confirming accurate country of origin of fish, of importance to marketing goods. The wholesale fish markets are a setting where a tacit knowledge is used to control goods. There is no documentation of the fish. Only sensory control is used to control the quality and safety of the fish. This system has proven efficient. However, in the case of direct distribution, documentation of fish quality and safety is of greater importance since sensory control of all the goods is more impractical when controlling units containing a large volume of the same type of goods. The risk of goods discrepancies, that is fish that has avoided quality control, is judged as greater in direct distribution, where goods inspections are less rigorous than at fish markets. Therefore, product traceability, supply chain actors in conjunction knowing how to *inform* about product safety and quality, is of greater importance when using direct distribution.

At present registrations of goods transformations through wholesale fish markets in Japan is not carried out. Therefore there is at present no traceability of fish products that are channelled through fish markets. Japanese fish importers express that they are waiting for the first food scandal to occur regarding fish distributed through seaside and wholesale markets in Japan. This will, as was the case when a food scandal was previously connected to beef, rapidly lead to legislation demanding full product traceability of fish in Japan. This will have a decisive impact on how goods are controlled at the fish markets, since controls must also be registered, and this information must be adapted for information exchange with other actors in the supply chain.

8. Concluding: Impressions, Remarks, and Questions

This preceding analysis, based on a limited case study material of fish supply chains, provides empirical-based direction for further research concerning the interrelationship between direct distribution and traditional forms of fish distribution using wholesale markets. Further detail is required regarding especially technical features of food quality and safety embedded in a supply network consisting of multiple interacting supply chains with flow of goods, the impact features of goods transformations (time-place-form) have on information, and opposite how transformed information then impacts on the flow of goods. Logistics and SCM aims to play a role as an enabler of managing *efficient* goods transformation in distribution through pushing forward a development of actor integration in the supply chain, involving better coordination of goods transforming activities involving efficiency of information exchange. The role of SCM should also be more closely explicitly considered in relation distribution structures for fish in Japan. Is SCM as a *management philosophy* of supply actor integration better fit with direct distribution or with more traditional modes of flowing fish through wholesale fish markets?

In addition supply chain integration measures may be impacted by features of other supply chains and wider societal and environmental features such as switching from tuna to salmon consumption for raw-fish consumption in Japan. The issue of informing about goods transformation, essentially when tracking goods and tracing products is regarded in this study as an integral part of food supply chains. A supply structure for distributing fish from Norway to Japan must accordingly also take into account features of the provision of this type of information concerning the past history and present features of goods in the supply chain. At present Japanese wholesale fish markets are facilities where product traceability is lost. Is this an absolute feature of wholesale fish markets? Can development of information systems

coupled with goods control techniques be developed to secure product traceability in these markets? Moreover, the interaction between controlling goods and tracing goods should be closely investigated concerning this form of interaction's relation to efficiency in information exchange; including multiple usage of product control information for tracking goods, marketing, societal purposes and more. These features exhibit an area for further studies regarding how informational resources may be recombined to achieve information efficiency in order to support efficient transformations of goods in individual supply chains. In logistics a greater focus on features of information efficiency in supply chains is called for. In food chains food safety and quality is secured through efficient goods identification, control, tracking and tracing; all activities where focus is on transforming information for primarily efficient marketing and/or logistics use.

These are some issues that should impact on a study of the use of direct distribution in relation to tradition distribution in Japan. The potential demise of Japanese traditional distribution structures for fish, based on an evaluation of logistics, marketing and network impacts on designing supply chains in accordance with either of these structural forms, is uncertain. It is argued that traditional market forms as well as direct distribution show signs of both efficiencies and inefficiencies. There is at this stage in research no unambiguous ground for viewing one way of distributing fish in Japan as more efficient then the other. Both forms may be developed using ICT. Direct distribution seemingly handles large units of goods and fewer supply chain actors more efficiently, while wholesale markets expose efficiency in handling the complexity of matching supply from numerous suppliers with numerous purchasers. It seems that the positive view of direct distribution held by Japanese and Norwegian intermediaries has evolved under pressure for cutting costs in supply chains showing low profitability. Is it then possible that these actors, under "pressures" of increasing short-term profitability are seeking redemption though "industrialising" fish distribution, by reducing seemingly obvious costs, and not taking into account more obscure interactions between cost and income? The solution to increase profitability in fish supply chains may seem to involve standardising goods, producing long series of identical products to achieve economies of scale. In this scenario, goods would be distributed by combining standardised products into fewer, but larger, *logistics units* (packaged goods handled in relation to logistics activities, see www.gs1.org) subject to fewer goods transformation actions. "Efficiency" in this seemingly "modernistic" perspective is almost "deterministic"; it will impact on the profitability of small-scale retail and restaurants in Japan unable to receive large logistics units. Such actors will therefore in a direct distribution scenario be dependent on intermediaries splitting logistics units into required smaller logistics units. These actors would then have some of the same goods allocating function as the regional wholesale fish markets, but without the balanced power between buyer and seller evident in selling/purchasing events at these markets.

A demise of the regional wholesale fish markets in Japan may therefore in practice erode the foundation of the small retailers and restaurants now characteristic of Japan. This represents a dramatic change in the business culture in Japan and is a scenario that should be further investigated. How Japanese consumers would react to an increase in integrated supply chains with fewer retail and restaurant actors needs also to be considered. Only careful empirically based analysis involving an unbiased assessment of development potentials may provide a foundation for understanding how direct distribution may be more efficient than the use of markets for transferring the title of fish. This analysis must not be biased by views that large-scale production and distribution necessarily is the most efficient mode of supply chain design, especially given the embedded nature of individual fish supply chains in a world market for fish products that may be described for analytical purposes as consisting of multiple interdependent supply chains in a network setting. It should be avoided that achieving efficiency through supply chain development in the "Japanese part" of fish supply chains becomes result of a self-fulfilling prophecy, where direct distribution is "locked in" as the only given solution when developing efficiency and value creation in fish supply chains.

9. References

Alderson, W. (1965), **"Dynamic Marketing Behaviour. A Functionalist Theory of Marketing",** Homewood IL: Richard D. Irwin.

Arlbjørn, J.S. and A. Halldorsson (2002), "Logistics Knowledge Creation: Reflections on Content, Context and Process", **International Journal of Physical Distribution and Logistics Management,** Vol. 32, Issue 1, pp. 22-40.

Auramo, J. J. Kauremaa and K. Tanskanen (2005), "Benefits of IT in Supply Chain Management: An Explorative Study of Progressive Companies", **International Journal of Physical Distribution and Logistics Management,** Vol. 35, No. 2, pp. 82-100.

Ballou, Ronald H. (1999), **"Business Logistics Management",** Upper Saddle River NJ: Prentice Hall.

Ellram, L.M., B.J. La Londe, and M.M. Weber (1999), "Retail Logistics." **International Journal of Physical Distribution and Logistics Management,** Vol. 29, No. 7/8, pp. *477-494.*

Engelseth, P. (2007), **"The Role of the Package as an Information Resource in the Supply Chain, A Case Study of Distributing Fresh Foods to Retailers in Norway",** Oslo: Norwegian School of Management BI, Series of dissertations, No.1.

Engelseth, P. (2007b), "Tracking Goods and Tracing Products in Food Chains: -A Supply Chain Management Capability", Proceedings of the **International Conference on Agricultural Economics, Rural Development and Informatics**, University of Debrecen, Centre of Agricultural Sciences, Faculty of Agricultural Economics and Rural Development, Hungary.

Engelseth, P (2007c), "Information Connectivity, Selecting Global Supply Chain Strategies and Agility in Complete Food Supply Chains", **Proceedings of the 19th NOFOMA Conference**, held at the University of Iceland, Reykjavik, Iceland.

Gadde L.-E. and Håkansson H. (2001), **"Supply Network Strategies"**, Chichester UK: John Wiley & Sons.

Gammelgaard, B. (2004), "Schools in logistics research? A methodological framework for analysis of the discipline", **International Journal of Physical Distribution and Logistics Management,** Vol. 34, No. 6.

Gripsrud, G. (2004). "The Marketing Discipline and Distribution Research: Time to Regain Lost Territory?" In Håkansson, H,. D. Harrison and A. Waluszewski (eds**.**), **Rethinking marketing: developing a new understanding of markets**, Chichester UK: Wiley.

Heskett J.L., N.A. Glaskowsky jr. and R.M. Ivie (1973), **"Business Logistics, Physical Distribution and Materials Management",** New York: The Ronald Press Company.

Håkansson, H. (1982), "**International Marketing and Purchasing of Industrial Goods",** Chichester UK: John Wiley & Sons.

Håkansson, H. and I. Snehota (1995), **"Developing Relationships in Business Networks."** London, Routledge.

Håkansson, H. and G. Persson (2004), "Supply Chain Management: The Logic of Supply Chains and Networks", **The International Journal of Logistics Management,** Vol. 15, No. 1, pp. 11-26.

Jahre, M., L-E. Gadde, H. Håkansson, D. Harrison, and G. Persson, (2006), **"Resourcing in Business Logistics - The Art of Systematic Combining",** Lieber AB, Sweden.

Lambert, D.M., J.R. Stock, and J.D. Pagh (1998), "Supply Chain Management: Implementation Issues and Research Opportunities", **The International Journal of Logistics Management,** Vol. 9, Issue 2, pp.1-19.

Lazer, W.M., Shoji, and K. Hiroshi (1995), "Japanese marketing: Towards a better understanding", **Journal of Marketing**, vol. 49 (Spring).

Lothia, Ri., I. Kyoichi, and R. Subramaniam (1999), "Changing Patterns of Channel Governance: An Example from Japan", **Journal of Retailing**, 75 (2), 263.

Min, H. (1995), " Distribution channels in Japan: Challenges and opportunities for the Japanese market entry", **International Journal of Physical Distribution and Logistics Management,** 26 (10).

Penrose, E. (1959), **"The Theory of the Growth of the Firm"**, New York: Oxford University Press.

Polanyi, M. (1966), **"The Tacit Dimension",** London: Routledge and Kegan Paul.

Rajaratnam, D and J. A. McKinney (1995), "Is the Japanese marketing system changing? An empirical study", **International Business Review**, 4 (23).

Rosenbloom, B (1995), "Channels of Distribution." In M. Baker (ed.), Companion Encyclopedia of Marketing, London: Routledge.

Popp, A. (2000), "Swamped in Information but Starved of Data: Information and Intermediaries in Clothing Supply Chains", **Supply Chain Management,** Vol. 5, No. 3, pp. 151-161.

Romano, P. (2003), "Co-ordination and Integration Mechanisms to Manage Logistics Processes across Supply Networks", **Journal of Purchasing and Supply Management**, Issue 9, pp. 119-134.

Shimaguchi, M. and W. Lazer (1979), "Japanese distribution channels: Invisible barriers to market entry", **Michigan State University Business Topics**, 27 (winter).

Thompson, J.D. (1967), **"Organizations in Action",** New York: McGraw Hill.