QUALITY ASSESSMENT IN INTERNATIONAL INDUSTRIAL MARKETS: THE CASE OF NORWEGIAN STOCKFISH

by

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ABSTRACT

Quality assessment is an important function within a firm. It creates a foundation for production according to the demands of the market, for choice of a distribution channel and for the pricing of products. Although there has been some research on quality assessment, there has been little research on the institutions that shape it.

It is often assumed that quality assessment is based on the use of objective rules and evaluation procedures. This paper uses secondary data from industrial export companies within the food sector to investigate whether this is so. It is shown that an institution for quality assessment mainly bases its quality classifications on objective product characteristics, but that the level of supply to the market effects the criteria used for quality assessment, making quality assessment more complex than normally assumed.

INTRODUCTION

In the last decade there has been considerable research done on international industrial relationships between international buyers and sellers (Håkanson, 1982; Ford, 1997). The focus is often on how to establish, develop and manage these relationships. There has, however, been very little research done on the institutions created to support these relationships and the effects of such institutions. According to Carson et al. (1999) there is a need for empirical work in this area.

This paper extends our current knowledge by describing an institution for quality assessment, and analysing how this institution uses criteria both related to the product as well as market information for quality assessment.

Quality assessment is an important function within firms. It creates a foundation for production according to the demands of the market and for guaranteeing a consistent product quality, as well as being a basis for marketing decisions such as the pricing of products, choice of a distribution channel and marketing communication. Although there has been much research on quality assessment, there has been little research on the institutions that shape this assessment.

This paper examines the institution of quality assessment that is created to support the export of dried cod (stockfish) from Norway to Italy. This institution facilitates relationships between producers, exporters and importers, and supports their interactions and marketing relationships.

The term "institution" is used in multiple ways. North (1991: 97) sees institutions as "the humanly devised constraints that structure political, economic and social interaction." Such constraints are both informal, e.g. traditions and codes of conduct, and formal, e.g. laws and constitution. Here the focus is on one informal institution; the quality assessment of stockfish.

In the field of modern macro-economic theory one takes, in addition to the traditional focus on price adjustment as a condition for market clearance between supply and demand, an increasing interest in observing the institutional factors of the market, in order to understand their way of functioning. Traditionally it has been a topic of interest on how one set of co-operating suppliers could utilise various payment intentions in various separate markets, e.g. nationally bound markets, in order to differentiate prices between the various buyer groups for the purpose of maximising profits, i.e. price discrimination.

Gradually more people have seen the chances of increased earnings inherent in the differentiation of the product in various quality levels for the various market segments, often as an addition to price discrimination. This article look at the rejection of stockfish as an institution serviced by producers and exporters as a means to differentiate products, and to sell them in nationally segmented markets.

QUALITY ASSESSMENT IN THE STOCKFISH INDUSTRY

In order to study the effect of market information on quality assessment, a sector with well-developed institutions will be used, namely the oldest export industry in Norway, the stockfish industry. The first records of Norwegian stockfish as an export article are from the 9th century, when the local chief Ottar, brought stockfish with him to England (Borch and Korneliussen, 1995). Norwegian stockfish has probably been exported continually since the 12th century, and for a long time stockfish was the only export article. The institutions used in this business have survived over a long period of time. The stockfish industry will therefore constitute a good example for the study of institutions supporting price fixing.

The stockfish industry today is mainly concentrated in a geographical area with the best production facilities, the Lofoten Islands. During the months from February to April the cod come into the Norwegian coast to spawn. The cod is caught, hung on racks out in the open air and dried by natural processes through wind and weather. This drying process takes place from February to June. When the cod is dry in June it is taken down and put into storage. At this point the process of quality assessment begins.

Quality assessment

The stockfish must then be assigned to categories based on quality. This quality categorisation is called discrimination. The person who carries out the discrimination is a discriminator. The discriminator is normally employed by a fish processor or an exporter. The discriminator is educated mainly through experience.

Over a long period of time the industry has built up a well-developed system of quality categorisation. This quality categorisation is important for the pricing of stockfish from the exporter to the importer. Stockfish discrimination changes over time. According to one discriminator, there were just 10 different quality categories 200 years ago, compared to as many as 40 categories today.

The discrimination process.

In the middle of June the stockfish in Lofoten are being taken down from the racks, to be moved inside for after-drying. The stockfish is put in layers facilitating free circulation of air through the piles of fish. The biggest fish need most after-drying and are thus placed on the sides and the top of the piles. A completely dried stockfish normally contains between 14 and 16 percent water.

The discrimination process starts while the after-drying is still in progress, and the fish will dry somewhat and thus change a bit after the completion of the discrimination. This has to be taken into consideration by the discriminators during the discarding process. The discriminators usually place the fish in 20 different categories for Lofotrund, i.e. unprocessed cod caught in Lofoten. The discrimination takes place according to a business standard, "Categorisation of stockfish".

The various categories of stockfish can be divided into the categories, prima (first-rate), secunda (second-rate), and tertia (third-rate). A prima fish is of prime quality. Prima fish embody various qualities within the various classes, but the common denominator is that it is flawless. In addition to that, it should have nice skin and good colour. Good climatic conditions and good processing of the raw material are required to achieve a prima finished product. Prima fish fetches the highest price in the highest paying markets. Important characteristics of a stock-fish of prima quality is its natural shape and open gut, and its clean neck and belly. It should furthermore be without signs of hanging, frost damage, or mildew. Secunda stockfish can have flaws and do not require a perfect appearance. Secunda fish are sold at high prices in the best markets, and must for this reason not have major flaws. Therefore even a secunda fish will require good treatment and good climatic conditions. Raw materials of lesser quality or good quality not subject to the proper processing will often turn into secunda stockfish. Secunda stockfish may have some fur on the belly section, partly closed belly and be somewhat frost-damaged, but not to the extent where the undamaged stockfish meat at the backbone becomes invisible. Secunda fish can contain a little blood or blood stains and some mildew can be allowed, but there must be no gaff wounds, lacerations or liver remains. Tertia stockfish is stockfish that does not comply with the requirements of prima or secunda products. The various markets have some variation in their requirements for tertia stockfish, but a common characteristic is its healthy and sound condition, suitable for human consumption.

There are a number of criteria for the discrimination of stockfish. Objective entities such as length, thickness and weight play a major part, but also appearance and more qualitative properties determine where the fish is assigned. The discriminators discretion remains essential in order to assess the quality of stockfish. Discriminators are accountable for the categorisation and have extensive experience from stockfish production. Discriminators are often apprentices with older discriminators in order to master the skill. To determine to which of the aforementioned categories a fish belongs, is partly a subjective assessment. Often the discriminator must open the fish in the neck to smell its quality. I.e. a discriminator must be able to assess the quality of a stockfish, but will hardly be able to give a full explanation of what makes a stockfish fall into one category or the other. When the discrimination is completed the fish is packed in bundles of 25, 45 or 50 kilos, depending on the markets, before it is exported.

Importers in Italy have a long experience in importing stockfish, and are therefore also good at evaluating the quality of the stockfish. Thus the importers have a chance to reassess subjective assessments made by the discriminators. If the importers find that the fish does not live up to the

categorisation by the discriminators, this could lead to complaints and, if worst comes to worst, that importers change exporters.

RESEARCH METHOD

Export companies finance their export through bank guarantees. As part of an application for a bank guarantee, the export firm has to provide the bank with a copy of the contract with the importer. This contract contains information about export volume, quality assessment and price. This research builds on loan applications (and copies of the attached export contracts) from 26 export firms during the time period from 1992 to 1997, that is 156 observations about the relationship between sales volume and quality assessment. This time period was chosen because of easy access to data. The quantitative data used in this research is based on the use of unobtrusive measures (Webb et al 1966, Webb and Weick 1979).

The quantity of cod sold at market (the catch) is measured through the use of public data, based on a thorough public system for measuring and keeping track the volume of cod landings.

Export volume is measured through the use of yearly Norwegian Export statistics, showing the volume of stockfish exported to Italy.

The export volume of stockfish from the companies in this sample was calculated by adding up their individual export quantities.

To give an indication of the degree to which the data used here are representative, table one shows the market share in the Italian market for stockfish of the firms that comprise this study.

Table 1: The quantity of cod landed in Lofoten during the period 1992 to 1997.

	1992	1993	1994	1995	1996	1997
Catch quantity	31854	49535	61833	51670	51793	57559
Export quantity	3.401	3.489	3.613	3.374	3.547	4.049
Sample quantity	1.434	1.940	1.751	1.294	1.155	1.349
Market share	.4216	.5560	.4846	.3835	.3256	.3332

The table indicates that the landed amount of unprocessed cod in Lofoten has varied between 32, 000 tons in 1992 and almost 58,000 tons in 1997. The total annual export of stockfish from Lofoten to Italy is relatively stable with a variation between 3,401 tons in 1992 and 4,049 tons in 1997. The 26 companies in this material exported between 1,434 tons in 1992 and 1,349 tons in 1997. They have thus had an average market share of about 42 % of the total export of stockfish from Lofoten to Italy. As this material covers a large part of the export companies and above 40% of the export quantity, we can assume that this material gives a representative picture of Lofoten's export of stockfish to Italy and in particular the connection between exported quantity and quality assessment.

Quality assessment (or perhaps more precisely the relative quality) was measured by first classifying the 22 quality types in our material into three main quality groupings; prima, sekunda and tertia. To do this, a well known and generally agreed upon grouping system was used.

Table two shows these classifications categorised in three quality classes: prima, secunda, and tertia.

Table 2**:** Quality Classification

Prima			Secunda	Tertia
BR	WA	WM 50/60	IG	TIPO B
GP	WC	WM 60/80	IGM	TIPO BB
HO	WM	WP	IM	TIPO C
LUB	WM 30/40	WPP	IMM	
R	WM 40/50		IP	

The group prima consists of the first 14 quality categories. The group secunda consists of the next five quality categories, while the group tertia comprises the final three quality categories.

In order to acquire knowledge of the material, the correlation coefficients between the exported quantity and the relative volume of the three main quality categories were initially analysed. Then a personal interview with three quality controllers and two company managers was conducted in order to acquire further knowledge of the data. The quality controllers make the quality assessment and are thus the persons who can provide the best information on those circumstances affecting the work the most. The company managers were interviewed in order to increase the knowledge of managerial aspects concerning quality assessment. This combination of quantitative data and qualitative interviews provide a good starting point for triangulation of the findings.

ANALYSIS

Table three shows pair-wise correlation between the variables landed quantity of fish in Lofoten, exported quantity of stockfish to Italy and the relative volume of stockfish in the three quality categories.

Table 3: The correlation between cod catch, export volume and quality assessment.

	Catch	Export vol	Prima	Sekunda	Tertia
Catch	1.000				
Export vol	.537	1.000			
Prima	-.632	-.647	1.000		
Sekunda	.358	.499	-.808	1.000	
Tertia	.683	.620	-.934	.544	1.000

The table shows a strong correlation between the landed catch and the export volume of stockfish (correlation of .537).

There is a strong negative correlation (-.647) between the export volume and prima stockfish. This means that when the export volume of stockfish is reduced, the proportion of prima fish increases.

There are strong positive correlations between export volume and sekunda and tertia quality. This indicates that when the export volume decreases, the proportion of sekunda and tertia quality decreases. This means that a change in export volume leads to a change in quality assessment.

DISCUSSION

In order to make sure that this relationship is not spurious, it is important to be able to rule out alternative explanations for the relationship between export volume and quality assessment. In addition to the market situation, there may be four factors (or alternative explanations) that can possibly influence the quality of stockfish: the quality of the living fish, the handling of the fish during the catching stage, the handling of the fish during the processing stage and the climatic conditions during the drying stage. These explanations will now be analysed.

Explanation 1: The quality of the living fish.

The quality of the living cod is, among other things, determined by the size and fatness of the cod coming in to spawn. The quality of the living cod varies from year to year. There appears to be no reason to assume that the quality of the fish should have any correlation with exported quantities. We can thus discard the quality of the living fish as the explanation to the correlation between exported quantity and quality assessment.

Explanation 2: The handling of the fish during the catching stage.

There are two circumstances with the potential to influence the quality of the fish during the catching stage. One is the choice of gear with which to catch the fish and the other is the fishermen's handling of the fish after bringing it onboard the boat.

The fish can have lower quality during the periods when there are few fish in the sea. This can be attributed to an inclination on the part of the fishermen to leave nets and lines in the ocean for several nights, leading to an increased proportion of dead fish being brought on board the boat. Thus the opening of the veins will not imply complete drainage of the blood from the fish. This can cause the fish to be of substandard quality during periods with few fish. This explanation conflicts with our findings; that there are more prima fish when there is a smaller quantity of stockfish on offer.

During the periods when there are few fish to catch, fishermen will have better opportunities to carry out complete drainage of blood from the fish, since they have more time available. This does not appear to be particularly significant. Fishermen will, in most cases, drain the blood in the appropriate manner, rendering the importance of this explanation only marginal. It is more significant for the quality of the fish that nets and lines are often left for several nights during periods of few fish. We can thus discard the handling of fish during the catching stage as the explanation of the correlation between the export volume and quality categorisation.

Explanation 3: The handling of fish by the processor.

There are very few factors affecting the quality of the fish with the processor. The most important thing is that the fish are quickly hung on the racks after being brought ashore. This is done on a very consistent basis. It is influenced only marginally by the quantity of fish, since the fish processors are not willing to hang more fish than they are able to put on the racks the same day as they receive the fish.

During periods of few fish the fish processing facilities buy fish they would not otherwise have accepted. During periods of few fish it is a seller's market. In this way fishermen will pressure the recipients to buy more small fish and fish of substandard quality. This may, to a certain extent lead to a situation where the quality decreases along with decreasing supplies of fish. This effect works in the opposite direction of our findings. We can therefore reject handling of fish by the processor as an explanation to the link between exported quantity and quality categorisation.

Explanation 4: Climatic factors.

Weather conditions affect the quality of the fish. There is, however, no reason to presuppose any link between weather conditions and the exported quantity. A possible explanation can be that during periods of few fish, the fish will be hung only on the better racks and be in a manner facilitating air penetration through the filled racks. This is not particularly important since the fish processors will never hang the fish in a way hindering sufficient air penetration. Fish processors will in no situation use racks located without good drying opportunities. We can thus reject climatic factors as an explanation to the link between exported quantity and quality categorisation.

After having examined these four explanations, there is little evidence that the fish is treated better during periods of little fish leading to a relationship between export volume and quality assessment. We will rather see that few fish leads to more bad quality fish since more fish are dead when being drained of blood, and because the fish reception facilities must buy fish of somewhat poorer quality than they would during other circumstances. The idea that few fish will allow more time for the fishermen to drain the fish of blood in a more secure manner, is only a minor factor in this context. After having examined and falsified the four alternative explanations, one explanation remains: market situation assessment.

Main explanation 5: Market situation assessment

Informants point out that the market situation constitutes the basis for discrimination. The exporter will influence the criteria for the discrimination based on market signals conveyed to the discriminator. Both the wishes of the Italians, and the access of raw materials influence the discarding. All the persons interviewed mentioned discarding according to the level of supply to the market and were convinced that this happened. There is in fact a word for this; stretching. When stockfish is stretched, it means it is assigned to a category higher than where it should originally be assigned. Our findings point out that during years with few fish stockfish is stretched more than during years with lots of fish. Hauan (2000) refers to quality perceptions as

being socially constructed. Stretching is a tradition that has evolved over the centuries during interaction between exporters and importers.

SUMMARY

The discarding practice has long traditions in the stockfish trade. It is unlikely that the industry would have hung on to this practice if it had been detrimental to the trade. The discarding process is relatively costly, in that every stockfish to be exported is individually assessed and categorised. The discrimination process has its function by putting the focus on the economic gain of adapting to the various market preferences. Preferences as to which qualities are demanded varies, depending on which Italian region the stockfish is exported to. Through discrimination the stockfish is adapted to the preferences of the various regions, putting the Italians in a position to choose the specific qualities they prefer.

The alternative to stretching stockfish may be a general increase in the price level during periods of few fish. This is because a situation with few fish creates a seller's market. This shows that it is the market that to a major extent defines quality criteria for stockfish, and that export quantity is an important criterion. Flexible quality assessment of this kind has developed over a period of time through the interaction between the exporter and the importer.

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