

Summary:

Fish transport as value adding activity

Background

The Norwegian fish industry has for some time experienced efficient transport solutions and low transport costs. One consequence is an increasing quantity of Norwegian fish processed abroad. For instance is frozen Norwegian fish carried by sea transport to China, where the products is prepared for the market. In addition, these products are often transported back to European consumers.

An increase in the Norwegian fish export sector creates larger demand for transport services from the fish industry. The products is carried by road, sea and air transport. The increased volumes of exported seafood from Norway is expected to be carried by road transport. A question is to what degree fresh fish transports could be transported by sea.

In the project “The competition in the Norwegian freight transport market“ the distributionsystem of Norwegian fish transports is studied.

The methodological framework is based on value chain theory and comparative analysis of transport costs, transport times and logistics related to Norwegian fish export.

The value chain

The definition of value creation varies a lot. Porter (1985) introduces *the value chain* as a basic tool when analysing the sources of competitive advantage: “The value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation.”

The value created on the way to the consumer is the sum of the increased values each industry add to the product. Mathematically, the value a industry adds to a product is the value the product achieves after the value-adding activity, minus the use of services/products produced by other industries. However, in the project we have focused on a more practical definition: The transport sector contributes to added value through faster end-to-end pipeline time, lower costs and better order achievement.

Transport costs for Norwegian fish exporters

Norwegian seafood products are carried by road, sea or air transport. Because of longer transport time, sea transport is primarily used for frozen, dried or canned seafood. For fresh or chilled seafood, road or air transportation are the main alternatives.

Transport by road is the usual way to distribute fresh fish from Norway to the European continent. Fresh seafood is transported by air to remote destinations such as Asia and North America. Fish carried by plane is sent from continental airports like Frankfurt and Amsterdam. For fish transported to the European market, railway from Northern Norway to Oslo and ferries from Southern Norway to Denmark and Great Britain is also often used.

Large volumes transported by full loaded trucks is crucial for achieving low transport costs for fresh fish. The cost also increases when smaller quantities of seafood is transported to larger terminals.

Table 1 shows costs per kilo fish for transports to different markets. The rates is mainly based on door-to-door transports (full loaded trucks), but as table 2 shows (costs of extra services) the real prices may vary a lot.

Table 1. Estimates on transport costs and transport times for road transport of fresh fish to Europe.

To	Transport costs (NOK per kilo fish)				Transport time (days)			
	From Bergen	From Trondheim	From Nordland County	From Troms County	From Bergen	From Trondheim	From Nordland County	From Troms County
Oslo	0,45	0,40	0,90	1,30	0,5	0,5	1,0	1,5
Padborg	1,10	1,05	1,55	1,95	1,5	1,5	2,0	2,5
BeNeLux	1,40	1,35	1,85	2,25	2,0	2,0	2,5	3,0
Northern France	1,60	1,55	2,05	2,45	2,5	2,5	3,0	3,5
Madrid	2,30	2,25	2,75	3,15	3,5	3,5	4,0	4,5

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For air transport, typical rates to Japan and other countries in the Far East lies between 16 to 19 NOK per kilo fish. Costs for sea transports of frozen fish to Southern Europe is approximately 1 NOK per kilo fish.

Table 2. Costs of different services

Service	Cost	In % of total transport cost	In % of export-price
Two drivers	+ 10 % on transport rate.	10 %	1 %
Transport of fish to terminal	Southern Norway: 0,15 to 0,40 NOK per kilo fish. Northern Norway up to 1,00 NOK.	7-33 %	1-4%
Reloading	1000 - 2000 NOK per cargo.	5%	0,5%
Transport as general cargo	+ 40-70 % on transport rate.	40-70 %	4-7 %

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Our research shows only small differences in transport rates between Norway, Iceland and Scotland. However, a comparison of examples of rates could lead to wrong conclusions. For Reykjavik the rates includes sea transport, which implies lower transport rates. On the other hand, Scottish fish exporters focuses heavily on time expensive and time efficient deliveries to France, often directly to supermarkets.

Still, examples of transport costs show that Norwegian fresh fish transports to the European continent is cost efficient. Variations in transport costs could be of domestic reasons or caused by different logistics and product quality, rather than general differences in transport rates.

Transport times for exported fish from Norway, Scotland and Iceland

Norwegian exporters claim that the logistics for fish transports is inefficiently organised. In the winter the industry find it difficult to maintain stable deliveries to the European continent, especially for seafood produced in Northern Norway. This could cause loss of market shares. A potential for added value in the fish industry therefore lies in developing the infrastructure in Northern Norway.

Table 3 shows large variations in preferred lead times for fresh fish. We see that the customers in the French market are time-sensitive. This is also case for buyers from the Danish fish industry.

Table 3. Maximum transport time to different markets:

Country	Degree of processing	Lead time allowed
Denmark	Whole fresh fish	1 – 2 days
	Fish fillets	5 – 7 days
France	Whole fresh fish	3 - 4 days
	Fish fillets	5 – 7 days
Germany		In general lower maximum transport time than for fish exported to France.
England		In general lower maximum transport time than for fish exported to France
China	Whole fresh fish	4 - 5 days

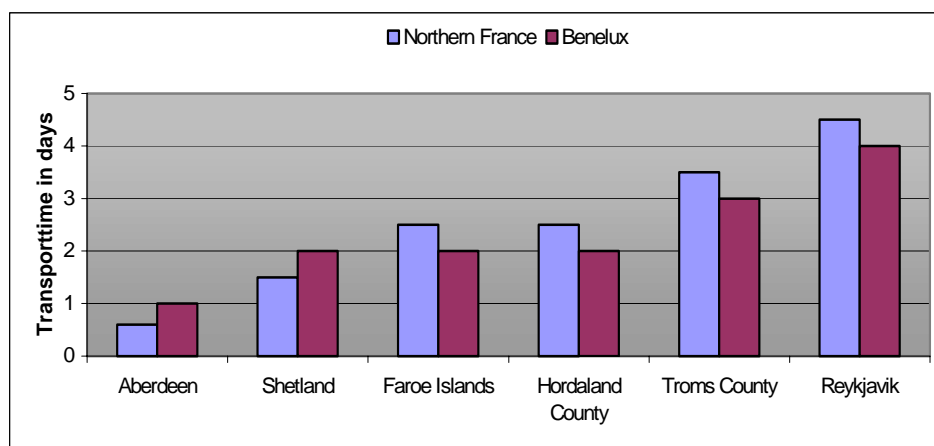
Source: SINTEF (2001)

Estimations from SINTEF (2001) indicates that whole fresh fish may lose 20-25 % of its value after 2 days. The value could be reduced to zero after 4 days.

The results show that short lead times is important to meet quality specifications. The amount of added value to the fresh products by the transport sector seems to be more time-sensitive than cost-sensitive.

In figure 1, examples of transport times to Northern France and Benelux is visualised. We have assumed a combination of sea and road transport for fish products from Iceland and Faroe Islands.

Figure 1. Transport times for fresh fish from different production areas to Northern France and Benelux



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Fish from Scotland has a natural competitive advantage when it comes to transport times to important markets as Northern France and Benelux. However, some of the important areas for fish farming in Scotland lies on Shetland and the Hebrides. This causes a considerable longer transport time to the French market.

Time and cost sensitivity

Estimates show that the fish export industry buys transport services for approximately 4 billion NOK every year. A conclusion in the report is that Norwegian fresh fish transports is efficiently organised when it comes to costs and transport time. However, the analysis indicates that a higher level of value creation could be reached through faster transports of fresh fish.

If we assume the export price to represent 40% of the price to the consumer, the transport cost is total of 5% of the final price. An increase of 20 % in the transport cost, will represent a 1 % increase in the consumer price. Table 4 shows scenarios resulting in similar conclusions.

Table 4. Increase in road transport costs compared to consumerprice

Market	Increase in transport costs		Increase in transport costs in per cent of consumer price	
Northern France	5 %	NOK 0,08	0,1 %	0,2 %
Transport cost:	20 %	NOK 0,32	0,3 %	0,6 %
Approx. 1,60 NOK per kg fish	50 %	NOK 0,80	0,8 %	1,6 %
Madrid	5 %	NOK 0,12	0,1 %	0,2 %
Transport cost:	20 %	NOK 0,46	0,5 %	0,9 %
Approx. 2,30 NOK per kg fish	50 %	NOK 1,15	1,2 %	2,3 %

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The significance of the variations in the transport costs seems low compared to value of time. When the delivery time exceeds certain limits, the value of the product could be reduced by 10 per cent or more measured against the price to consumer.

As mentioned, frozen fish products is often shipped by sea transport at low rates. Time costs and the need for flexibility is low for these products. This means the potential for increased value creation in the value chain probably lies in the fresh fish transports. This is also the reason why considerable resources is used to develop faster transports at sea. Such transport may also lead to reduced road transports.

Conclusions

Calculations in the study show that a realistic increase in the transport costs will seldom force exporters to transfer fish from road transport to sea transport. If we look at the value chain as one unit, variations in road transport costs represent a very small share of the price offered to the end-consumer. Estimates for time costs for fresh fish varies. Typically the price is reduced by 20-25 per cent after 2 days. After 3-4 days the products could be valueless. Our research indicates that transport time is the important factor for success in the Norwegian fish industry supply chain. The flexibility the road transport companies can offer is also important. In Northern Norway for instance, the weather often cause larger delays for sea and railway transports, than for road transport. The flexibility in the road transport services gives a larger degree of independence to deviate from fixed time schedules.

The time-sensitivity also shows the importance of success in all activities of the value chain. A more efficient transport solution may improve the total output from all industries in the value chain.

With the existing market structure for Norwegian fish products, theoretical results in the study combined with analysis of key performance indicators show that faster fresh fish transports represent a potential for value creation.

Since the road transports seems to be competitive and efficiently organised, faster transports may demand new technology such as special constructed express boats.

However, until this new technology is developed it will be important to maintain the efficient road transports. Investing in road infrastructure from production areas to main ports, could accelerate the process of transferring sea transports of fresh fish into economic profitable solutions.