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Sustained competitive advantage based on high quality input

Jon Nilssen [a], Bernt Arne Bertheussen [b], Bent Dreyer [c,*]

[a] Norwegian College of Fishery Science, UiT The Arctic University of Norway, N-9019 Tromsø, Norway
[b] School of Business and Economics, UiT The Arctic University of Norway, N-9019 Tromsø, Norway
[c] Norwegian Institute of Food, Fisheries and Aquaculture Reseach (Nofima), Muninbakken 9-13, Breivika, NO-9291 Tromsø, Norway

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ABSTRACT

It is often observed that some firms perform better than others within a population of firms producing the same products. In this paper, potential sources for creating sustained competitive advantages are addressed. According to the resource-based view of the firm, this phenomenon is rooted in heterogenic firm resources and immobility of key resources. This paper reports the findings from an empirical study of the Norwegian seafood industry. By analyzing internal financial statements in a period of 12 years it is revealed that some firms perform over average compared to its competitors. These firms are said to have a competitive advantage. Based on this observation it is analyzed how firms act to cope with input uncertainty. The firms are grouped according to their relative performance, and it is found that the best performing group is supplied with high quality fresh fish. The paper discusses implications of the findings, both managerial and theoretical.

1. Introduction

In the strategy literature, there is an ongoing debate linking strategic choices to financial performance of firms. According to Porter [37,35], a firm can gain competitive advantages by adapting to its business environments. Barney [3,4] on the other hand, claims that there may be considerable performance differences between participants in the same industry because the players hold various resource portfolios which form the basis for sustainable advantages.

In recent decades, the business environment has been subject to greater uncertainty in several industries. Driving forces such as globalization, technology and innovations have catalyzed the development of structural turbulence [10]. The environment can change rapidly, and the firms' resource portfolios will vary. What some businesses consider as threats, others may view as possibilities. This leaves room for different strategic adjustments.

A good example of this is the Norwegian fish processing industry, particularly the part that produces fillets of white fish, i.e. cod, haddock, and saithe. The structural changes have been brutal, and many see this part of the industry as "a coherent crisis" [16,20]. Financial losses and apostasy has characterized the industry. The number of fillet firms from the glory days of the 1970s and until 2013 was reduced from approximately 100 to 10.

At the bottom is an inherent challenge related to fish biology. The species' migration patterns and accessibility have made it profitable with a seasonal fishing. Moreover, technology and logistics solutions have changed the competitive conditions for Norwegian fillet companies. International players with low labor costs have joined in the battle for frozen raw material and lifted what once was a local market for raw materials to a global market [5,7]. The changes in the competitive conditions have been difficult to deal with for Norwegian fillet companies. A petro-driven economy with high costs and a strong currency has also contributed negatively to the competitive position of an already pressured industry.

Never the less, previous studies have revealed that among the remaining companies there are some that deliver better financial results over time than others [12,26]. Rooted in the literature and previous studies and empirical observations, this study addresses whether there remains firms in the Norwegian fish processing industry positioned in front in terms of financial performance. If this is the case, the intention is to reveal key attributes that can be sources for competitive advantages for the best companies.

The article continues by reviewing the strategy literature that sheds light on why some firms perform better financially than others. Next, research design and choice of empirical setting is presented. Finally, results are highlighted followed by a discussion and conclusion.

2. Theory

This article focuses on whether, and if so, why some companies perform better than others do. Different theoretical approaches attempt to explain profitability variations. One approach is

* Corresponding author.

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studying characteristics of the competitive arena [37,35], while another approach emphasizes internal attributes of the company [3]. The approach chosen explains the profitability differences between firms by combining these two perspectives. Such an integrated perspective is methodologically challenging because it requires thorough contextual knowledge about both the competition arena, and what attributes each firm in the industry possesses.

The positioning school, with roots back to classical economics and industrial organization, is a theoretical approach that has received much attention since the 1980s. Here it is argued that strategic choice and performance is essentially contingent on characteristics of the industry, which the company is a part of. A fundamental assumption is that the main driver of profitability is at the industry level. To identify the potential profitability of an industry often five forces are studied—(1) rivalry among competitors, (2) threats from intruders, (3) threats from substitutes and the bargaining power of (4) suppliers and (5) clients [36].

The positioning school is based on implicit assumptions from the neoclassical tradition that firms are homogeneous in terms of the resources they possess and the strategies they choose. A company can achieve extraordinary profit (super profit) by either being cost leader, or differentiate itself—that is to produce goods and services that reap a price premium.

The *resource-based perspective* emerged as a rival to the positioning school and its explanation of competitive advantage. The positioning school was criticized for assuming that firms base their strategic decisions on the same information about the competition arena and that this information is interpreted alike. Moreover, environment theory assumes that all firms in the population have equal access to resources [3]. As a consequence, companies implement identical strategies so that differences in profitability will be eliminated over time.

The level of analysis of the resource-based perspective is the company and its resources. Profitability differences are determined by the availability of company-specific resources at any given time [18]. A key issue is that firms have different abilities to select and implement strategies because resources can be heterogeneous and difficult to imitate. Strategic choices undertaken on the basis of valuable resources with limited mobility can therefore be sources to competitive advantage.

The literature review underpins that choice of theoretical perspective determines which factors are assumed to explain why firms perform differently. Previous empirical studies have attempted to shed light on the perspectives abilities to explain the phenomenon by measuring the impact of performance differences on the industry and the corporate level.

Schmalensee [40] found in a comparative study that the industry impact was most important. On the other hand, Rumelt [39] uncovered that business impact is significant and important for explaining profitability variations. The empirical studies therefore indicate that both industry and company-specific attributes may influence firms' financial performance. By integrating positioning school and resource-based perspective it is possible to control for numerous factors which are omitted by just using one of the perspectives. In its simplest form, by combining the two perspectives, each of them can represent one part of the SWOT framework (see Fig. 1).

The two theories both explain performance variations on the basis of competitive advantages. The model in Fig. 1 indicates that competitive advantages can be created internally (strengths/weaknesses) or on the competitive arena (opportunities/threats). The perspectives are complementary in that they attempt to explain performance variations by using different levels of analysis. Therefore, one of the perspectives does not exclude the other [3,10].

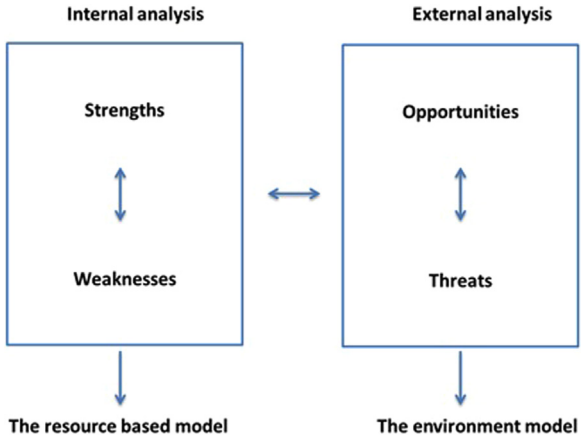

Fig. 1. The relationship between the resource-based model and the environment model for analyzing competitive advantage [3].

Both the positioning school and the resource-based perspective emphasize that the players must take into account the uncertainty of the environment when designing strategies [12]. However, the two perspectives, give different recommendations on how uncertainty can be managed. The positioning literature has a more proactive approach where the company actively attempts to control uncertainty through coordination within the value chain [37]. This is not a rigid recommendation in the resource-based perspective. According to this theoretical approach, the firm must choose strategies that balance their own capabilities against the challenges that prevail in the competitive arena [26]. Here, other approaches, such as using the market actively, can work well.

Isaksen et al. [26] have exposed that there is not a direct relationship between how uncertainty is managed and performance in the fillet industry. Both vertical integration and flexible use of the market can provide decent financial results. However, it is important to understand the competitive arena and implement strategies that exploit the company's strengths and protect against weaknesses. Often there is distance between what is considered as an optimal solution, and what is practically feasible for the business. In this case, strategic choices are a compromise between the optimum and the firm's resource constraints. With this important insight in mind, this study seeks to answer empirically the following research question:

> Do the best companies possess internal strengths that better enables them to exploit opportunities and avoid threats in uncertain external environments than the rest of the industry?

3. Research design

The research design of an empirical study utilizing the theoretical perspective outlined in this article requires in-depth knowledge of the opportunities and threats in the external environment. The design also requires the development of good measures of firms' resource position, that is, their strengths and weaknesses. Finally, a dataset of all firms in the population over a period covering the term sustained is needed.

3.1. The impact of the industry (external opportunities and threats)

Environmental theory requires in-depth knowledge of the competitive arena being studied. It is important that the environment is as similar as possible for the companies that are compared. By focusing on one single industry it is possible to control for industry impact [31] which, according to Porter [37], is crucial for firms' profitability.

3.2. Firms' resource positions (internal strengths and weaknesses)

The resource perspective requires good measures of firms' individual resource position [12]. Previous empirical studies utilizing this perspective have often been of the case type [2]. The literature recommends a comparative design to avoid the weaknesses of case analyzes [38,10]. In this study, the entire population is included to reveal if there are companies with financial results that indicate sustainable competitive advantages. Moreover, the population is split into three groups in line with a financial performance measure. Then the performance in the groups is compared, to be able to explain what strengths they possess that produce unequal profitability.

3.3. Sustained

The companies must be studied over time to uncover whether the attributes they possess can be sources of sustainable competitive advantages. The time perspective is contingent upon the dynamics of the industry structure. Industries which experience a high level of uncertainty in the environment require a shorter time span of the analysis than more stable industries. A key intention of this study is to investigate an industry with frequent and unpredictable changes in the environment. In this context, it is considered that a period of twelve years (2002–2013) is sufficient to embrace the concept of sustained.

3.4. Empirical context

The requirement of a challenging research design is met by the empirical context chosen. The Norwegian fish processing industry is engaged in the production of whitefish fillets. The companies in the fillet industry buy, process, and sell fish in the form of fillets. The population is geographically limited to companies in Norway, and consists of a few heterogeneous entities in terms of size, localization, and performance.

3.5. External threats when harvesting from wild resources

The production of the filleting industry is founded on a raw material harvested from a wild fish resource. The access of the resource is based on biology and abiotic factors that are affected by "state uncertainty" [32]. That is, conditions that are problematic to manage and control for the companies. Fisheries management measures are implemented to limit the annual fluctuations in catch level. For the three most important stocks – cod, haddock, and saithe – there are established harvesting rules to ensure that the annual quotas are not changed more than a certain percent from the previous year. Nevertheless, there is uncertainty regarding the size of the annual catch level. In the period 2002–2013, the largest cod quota was 1000,000 t, while the smallest was only at 435,000 t [33].

However, the annual quota fluctuations are not the biggest problem for the companies [27,25]. Variations in landings over the year is an even greater challenge for the players (ibid.) Fig. 2 shows that there is a distinct capture peak in the winter months for the main species of cod, although haddock and saithe moderate the variations. Nevertheless, the supplies vary significantly over the year.

Fish migration (availability), size, and biological fluctuations in quality are enforcing a seasonal logic that creates economic challenges for the companies in the fillet industry [24]. This makes it difficult to utilize production capacity optimally. Moreover, it is problematic for companies to supply the market continuously.

3.6. External threats—Increased global competition

By introducing mobile trawlers, the fillet companies were able to smooth out seasonal variations to some extent. During the 1990s to the present day, however, new technology and logistics solutions have globalized the commodity market for frozen raw fish [5,20]. International companies with low labor costs have access to this market and can outperform Norwegian fillet companies on raw material price [28,16].

The Norwegian fillet companies are addressing the tough international competition by making products that are difficult to duplicate in the competitor countries. Studies have shown that fresh raw material of high quality provides more product options and obtain a better price in markets willing to pay for the benefits [21,22,19]. Through a favorable geographical location close to rich fishing grounds, a fresh fish strategy may enable the firms to differentiate themselves from frozen fish players. Therefore, localization, fishing method, storage and processing of the fish will be important for the companies in the population. According to the Heide and Henriksen [19], hook caught fish is more suited to the production of fillets than fish caught in large hauls with seines and

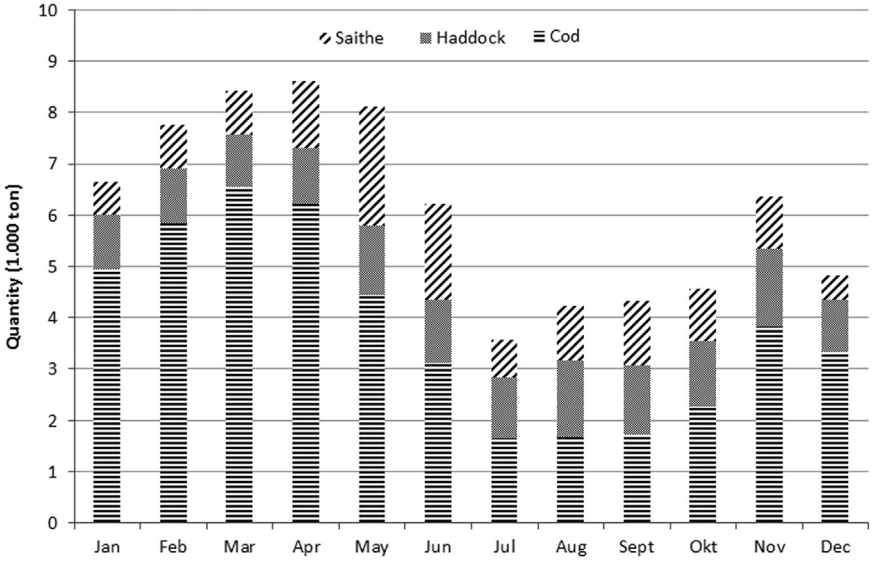

Fig. 2. Seasonal profile on the delivery of cod, saithe and haddock for the firms participating in this study in the period 2002 to 2013. *Sources*: The directorate of fisheries and the profitability survey of the fish processing industry.

trawls. It may, however, be challenging for the land plants to buy raw materials from the coastal fleet. Bad weather conditions can make it difficult for the local fleet teams to ensure continuity of supply. Hermansen et al. [25] found that the coastal fleet had a much larger variation in cod landings over the year than trawlers.

Moreover, the consumer market for fillet products is transforming. Defrosted fillets have gained a reputation as a competitor to genuinely fresh fillets. According to Egeness et al. [15], consumers in the UK can find defrosted fillets in self-catering coolers based on frozen whitefish. Stores that sell fish want a steady predictable flow of goods throughout the year. Defrosted fish products can meet this requirement to a greater extent than genuinely fresh products. If the consumers find that the defrosted fillets quality is good enough, they can be a serious competitor and threat to genuinely fresh fillets.

3.7. External threats—Institutional frameworks limit the scope of action

In addition, institutional conditions can affect firms' ability to create acceptable financial results. The industry is characterized by a rigid institutional framework that reduces firms' strategic scope of action. The Participation Act is central because it limits who is allowed to own fishing vessels. The general rule is that the owner must be fishing actively. Thus, a fish processing company cannot own a vessel itself. But exemptions have been granted from the ownership cap.

Some fish processing plants have been allowed to own and operate trawlers to ensure a smooth and stable access to raw materials [44]. The trawlers are, however, obliged to deliver to the plant. This implies that there are obligations to where the fish should be delivered, how the price should be set, and how the fish should be processed.

In the strategy literature, vertical integration is often considered as a mean to reducing uncertainty related to raw material quality and available volume [27]. However, several studies show that the obligation to deliver has little impact on firms' profitability [17,14,27,25].

The price of raw materials often reflects uncertainty on the supply side. Through the Raw Fish Act, fishermen are guaranteed a minimum price on the sale at first-hand because all sales must be made through sales organizations owned by the fishermen, that is the suppliers. The intention is to stabilize prices and ensure that fishermen get their "fair" share of the catch value.

A review of the empirical context illustrates some of the threats that companies in the Norwegian fish processing industry face. The biggest uncertainty can be traced to the availability of raw material where the variation in volume and quality of the year is crucial. But by using different gear, location, deliver obligation, processing, and storage the uncertainty related to raw material supply opens up for strategic adjustments. In the next section, the dataset is described and working hypotheses presented that might uncover key attributes that explain variation in profitability.

3.8. Measuring performance

In line with the theoretical perspective, the aim is to explain performance variations by emphasizing that firms possess attributes (strengths/weaknesses) which to varying degrees are able to cope with the opportunities and threats in the competitive arena [9]. The availability of raw material—that is, volume, species, and quality, represents the most significant uncertainty in the environment [34,10,27]. In this study, it is therefore chosen to underline the link between financial performance and raw material uncertainty.

The profitability survey for the fish processing industry (from now on called PSFPI) provides precise data on the business level. PSFPI is an annual survey carried out since 1977 in which production and financial statistics are collected at the firm level. The survey is based on financial statements from all companies in Norway that produce various kinds of seafood. In PSFPI, companies are split into sub-populations depending on their product portfolios and important sources of raw materials.

Here the focus is on those companies, which mainly produce fillet products based on wild whitefish species [8]. In the analytical period (2002–2013), the total population has depleted from 15 companies to five. 20 different businesses have been included in the population, each of them with at least one year of operation. The industry structure has been characterized by firms disappearing from the population, being acquired or shutting down the production in parts of the period.

The time period we have chosen illustrates the structural turbulence the fillet industry has been and still is in. It is of particular interest to study sustainable competitive advantages in a population like this, because the selection process is rapid, and the financial effects of strategic choices are quickly visible. In such a setting, the prospects are better to uncover which strategic choices may explain variability in firms' performance. Many studies of sustained competitive advantage are criticized for not controlling in a convincing way if the success criteria that are identified also were present among the dropout companies [6]. This is an important criticism because studies that draw attention to *why* businesses achieve sustainable competitive advantages should choose a design and data that make it possible to measure the strategic choices and performances over time in the entire population—also including the companies that are performing poorly and drop out.

The design chosen is first focusing on whether some companies in the population have competitive advantages. Next, these firms are compared with the rest of the population to illuminate the variations. A company with competitive advantages will be more profitable than a company without such advantages. The performance measure used, return on assets, includes the total activity in the enterprise, and enables comparing companies of different sizes [27].

The time aspect signifies whether the advantage is sustainable or not. This study extends over a period of 12 years (2002–2013). We therefore assume that sustainable competitive advantages can be traced by some companies having achieved higher return on their assets than others during this period.

Based on return on total assets, it is constructed a relatively profitability measure that takes into account the companies' performance over time [12]. All fillets companies have been assigned a value from 1 to 4 depending on the profitability quartile they have been in each year of the analytical period. The value 4 indicates that the company that specific year is in the quartile with the highest return on assets, while 1 corresponds to the quartile with the poorest profitability.

Next, the average score for each firm for all years have been estimated. Thus, it is possible to compare a firm's relative profitability in the population. Firms that over time has profitability close or equal to 4, is defined to have a sustainable competitive advantage.

3.9. Performance groups

In the population, two companies achieved a relatively profitability measure near or equal to 4. This means that they were among the most profitable fillet companies almost every year throughout the analysis period. At the opposite end of the scale, there were nine companies that had a relative profitability measure near or equal to 1. The remainder of companies (9) ended up in quartiles 2 and 3. In Table 1 they are turned into one category and

Table 1
Relative profitability indicator and average raw material volume (all species) for the performance groups.

	Best	*Medium*	*Poorly*
Number of companies	2	9	9
Years of operation	12.0	8.0	3.2
Relative profitability, Mean*	3.71	2.67	1.52
Relative profitability, SD	0.550	0.934	0.634
Volume of raw material, mean (t)	6.135	5.831	1.786
Volume of raw material, SD (t)	1.035	1.042	865

*Single Factor ANOVA showed significant differences between the groups, $p < .000$.

named Medium. A Single Factor ANOVA test demonstrated a significant difference between the group averages ($p < .000$).

This establish an empirical basis for making a systematic analysis of the properties (internal strengths/weaknesses and opportunities/threats in the environment) that can explain performance differences in the population. To do so, in a systematic way, working hypotheses are developed in an attempt to explain the variation in profitability.

3.10. Empirical hypotheses

In this main section, the empirical hypotheses related to the research questions are presented: Do the best companies possess internal strengths that better enables them to exploit opportunities and avoid threats in uncertain external environments? In the discussion, the hypotheses are related to the study's theoretical framework as illustrated in Fig. 1.

3.10.1. High quality raw material

The establishment of a global market for frozen raw fish caused the erosion of Norwegian fillet companies' main competitive advantage according to Sogn-Grundvåg et al. [41]. The companies would lose in the competition of international players with low labor costs if they just based their production on frozen fillets [13,5]. Therefore, it became important for Norwegian fillet companies to differentiate themselves in the market place. For international players, it is challenging to imitate a production form based on fresh raw material. Research indicates that there are markets willing to pay extra for fresh fish products [30]. Through their localization, close to fishing grounds, Norwegian companies have access to such raw material. A fresh fish strategy can be a source of competitive advantage for firms that can manage the challenges related to continuity of supply and quality of raw materials (ibid.)

Companies focusing on raw material quality can achieve a higher sales price [19]. The product yield is central. Through high product yield the sales volume will increase [29]. Simultaneously, a greater proportion of the fillet can be applied to the highest-paid products (ibid). Fresh fillets are, however, vulnerable to the number of days they can be on store shelves until they must be consumed [19]. Products of high quality raw material have the potential for longer shelf life than raw materials of poor quality. Raw material quality can also affect labor costs (ibid.). A raw material with few errors and high degree of freshness, results in lower labor costs. High quality raw material will thus contribute to both increased revenues and reduced production costs.

An important driver for raw material quality is the fishing gear used to catch the fish. Several studies indicate that fish caught with hook gear (long line and hand-held line) has few capture injuries and provide the best quality [1]. Such gear is also more specific in terms of the fish size. This is important because size determines the application of the catch [30,1]. For the fillet industry, small and medium sized fish is optimal since filleting machines cannot handle too big fish [43].

Thus, high performing companies are expected to better exploit the possibilities related to geographical proximity to rich fishing grounds and that they mainly produce output from fresh raw materials. A raw material strategy based on fresh fish can provide a basis for product differentiation. Accordingly, the best companies are predicted to focus on delivering fish from gear that provide high quality raw material.

Quality is measured along two dimensions. First, the proportion of fresh deliveries to total annual deliveries is measured. Next, the proportion of annual deliveries from hook gear is documented. It is predicted that:

Hypothesis 1

H1a. The best performing fillet firms have a greater proportion of fresh deliveries than the other do.

H1b. The best performing fillet firms have a higher proportion of deliveries from hook gear than the other do.

3.10.2. Raw material cost

Another key element for achieving profitability is the price of essential inputs. The Raw Fish Act curbs price fluctuations, but raw material price is extremely important as raw material costs account for between 60 and 85% of the firms' total costs [8]. The price of the input factor has a major impact on the companies' financial performance. Therefore, it is important that companies focus on minimizing raw material costs.

The raw material cost variable is operationalized by calculating the average of annual raw material cost per species (cod, haddock, and saithe) divided on the annual quantity per species. In this context, it is assumed that:

Hypothesis 2

H2. The best performing fillet firms pay less for raw materials at first hand than the other do.

3.10.3. Capacity utilization

One of the main advantages of the Norwegian fishing industry is the unique access to fish [41]. Nevertheless, variation in production volume over the year is one of the biggest challenges for fillet companies [30]. Previous studies have documented that capacity costs in the fillet companies account for a larger share of the cost when compared to other Norwegian food industries [11,8]. Therefore, the fillet companies are particularly vulnerable to fluctuations in raw material supply. For the players in the industry, it is important to obtain sufficient and suitable raw material to secure stable production throughout the year. A business that accomplishes this without compromising on other factors, such as price and quality, will be able to achieve better financial results. The variation in raw material supply is measured by calculating the average of the monthly standard deviation of the sample period. A large standard deviation indicates an uneven access to raw materials, while a low indicates a stable supply over the year. Therefore the following hypothesis is proposed:

Hypothesis 3

H3. The best performing fillet companies have a more stable supply of raw materials during the year than the other do.

Fig. 3 summarizes the empirical hypotheses and the expectations for the best performing fillet companies.

4. Results

In the research design section, measurement of financial performance was described and how these measurements have provided a basis for establishing three performance groups of fillet

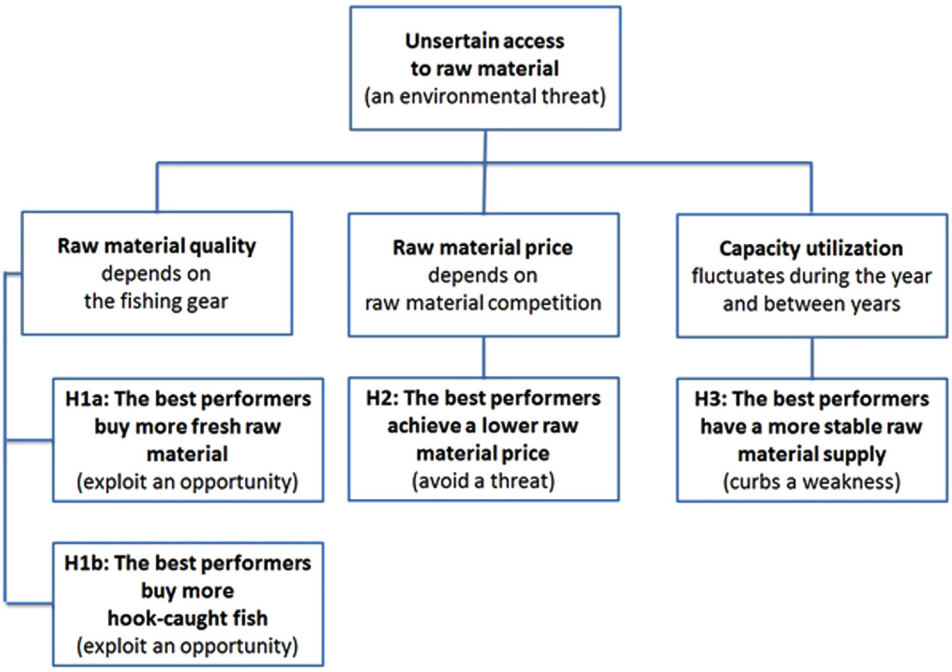

Fig. 3. Review of the empirical analysis model with expected performance of the best companies in the population.

Fig. 4. Average percentage of fresh deliveries of the performance groups in the period 2002–2013. *Sources*: The directorate of fisheries and the profitability survey of the fish processing industry.

companies (Table 1). In this section the empirical findings are presented in the same order as in the analytical model (Fig. 3).

H1a. The best performing fillet firms have a greater proportion of fresh deliveries than the other does.

According to Hypothesis 1a, fresh raw material was expected to be an important value driver for the fillet companies. Fig. 4 illustrates the percentage of fresh deliveries in the three performance groups.

Fig. 4 shows that the best performing fillet companies received a proportion of fresh raw material between 95 and 100%. For the Medium group, the average proportion of fresh raw materials was between 76 and 96%. For the Poorly group, there is a large variation from year to year, but the proportion of fresh shipments is significant lower than in the Medium and Best groups. Fig. 4 also discloses that

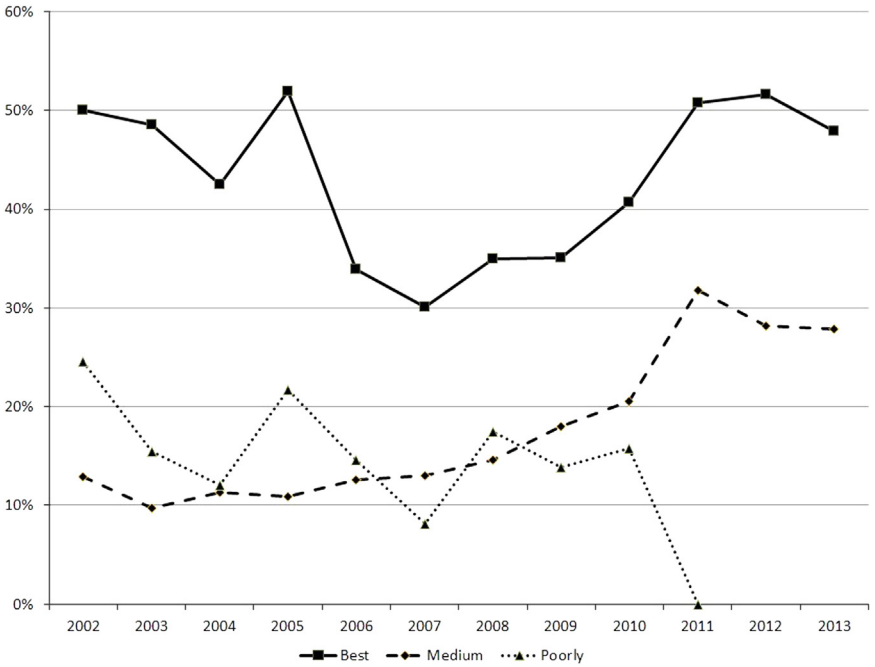

Fig. 5. Average proportion annual landings from long line and other hook gear. *Sources*: The directorate of fisheries and the profitability survey of the fish processing industry. *Single Factor ANOVA showed significant differences between the groups, $p < .000$.

the proportion of fresh deliveries increased for the Medium group throughout the period. Based on the results in Fig. 4, it is not unreasonable to respond affirmatively to Hypothesis 1a. The best performing fillet firms have a larger proportion of fresh deliveries than other companies do.

H1b. The best performing fillet firms have a higher proportion of deliveries from hook gear than the other do.

Since raw material quality is important for the profitability of fillet production, it is expected that the most profitable fillet companies have succeeded in obtaining the best raw material. Fig. 5 shows that the Best group is focusing on the best raw material quality. In 2013, this proportion represents approximately 50% of all deliveries in the best performance group. For the Medium group, the proportion of deliveries from hook gear increased over the period. Nevertheless, the proportion was significant lower than for the Best group. For the Poorly group, the proportion of hook caught fish declined in the period. Based on the results in Fig. 5, it is reasonable to confirm Hypothesis 1b. The best performing fillet firms have a higher proportion of deliveries from hook gear than the other companies do.

Hypothesis 2

The best performing fillet firms pay less for raw materials at first hand than the other do.

Raw material costs represent the largest cost item for companies in the fillet industry [8]. Raw material price will therefore have a major impact on overall financial performance. Table 2 shows the average raw material cost of the main species for the performance groups.

Table 2 shows that both the best and medium performing fillet firms on average pay less per kilogram of raw material for the species cod and haddock than firms in the Poorly performance group. Price differences between the groups range up to 1.74 NOK per kilo. The result was not the same for the species saithe as for cod and haddock. For saithe, the lowest raw material costs were observed in the group Poorly. This may be due to two players who receive saithe caught by seine. This fish is of a smaller size and is bought to a lower price than saithe landed with other type of gear.

Table 2
Average raw material cost (NOK) for cod, haddock, and saithe for the three performance groups in the period 2002–2013.

	Best *Mean*	**Medium** *Mean*	**Poorly** *Mean*	*p-Values**
Cod	11.62	11.60	13.36	0.21
Haddock	7.37	7.33	8.71	0.06
Saithe	4.60	4.27	3.65	0.05

* Single Factor ANOVA test showed no significant differences between the groups for any of the raw material species.

Table 3
Landing pattern of the three performance groups in the period 2002–2013.

	Seasonal variation *(standard deviation)*			
	Best (%)	*Medium* (%)	*Poorly* (%)	*p Values**
Cod only	6.65	4.67	5.76	0.00048
Cod, haddock, and saithe	4.16	3.21	4.87	0.007335

* Single Factor ANOVA test showed significant differences between the groups for both categories of raw material species ($p < .000$). However, a Tukey–Kramer test ($p < 0.05$) showed only significant results between the medium and best groups for cod only, and between the medium and poorly groups for cod, haddock, and saithe.

Although the variation in raw material cost is relatively large between the groups, a Single Factor ANOVA test showed that the differences were not significant. The best and medium performing companies are paying less per kilogram of raw material for the species cod and haddock, but not for saithe. Hypothesis 2 that the best fillet businesses pay less for raw materials at first hand than other firms do is thus not confirmed in the analysis.

Hypothesis 3

The best performing fillet companies have more stable supply of raw materials during the year than the other do.

For a fillet business, regular supply of raw material is a prerequisite for achieving good capacity utilization and profitable production. Table 3 shows the landing pattern of the three performance groups.

Table 3 shows that all groups utilize a raw material which is based on a season-based fishery. Firms in the Medium group experienced the least seasonal variation with a standard deviation of 4.67% for cod only, which was significant lower (Tukey–Kramer test, $p < 0.05$) than 6.65% for the Best group. The Medium group also had the lowest standard deviation (3.21%) for the species cod, haddock, and saithe added up. This result was significant lower (Tukey–Kramer test, $p < 0.05$) than 4.87% for the Poorly group.

All performance groups manage to curb the seasonal fluctuations of cod somewhat by turning production to other species (haddock and saithe). Since the results in Table 3 favors the Medium group and not the Best group, it is reasonable to reject Hypothesis 3 that the best fillet firms have a more stable supply of raw materials throughout the year than the other firms do.

5. Discussion

This article is motivated by a question, which has received a lot attention in strategic studies—why do sustainable profitability differences occur among firms that have the same type of production? In the approach taken, this phenomenon is studied in an industry that over time has struggled financially. Focusing on the competitive arena, the attention has been drawn to a population of firms that base their production on a wild resource with an uncertain supply of raw material. First, there are variations in raw material quality. Second, the raw material price varies. Third, due to biology and migration pattern the supply fluctuates highly both within a year and between years.

The initial hypothesis was that if some companies achieve sustainable competitive advantages, they must have been able to handle quality, price, and volume fluctuations in a better way than other fillet companies do. The study of the phenomenon of performance-related variations required a two-stage design. In step 1, the relative corporate performance over time was measured. It revealed that a small group of companies achieved better financial results than the other even though they operate in virtually the same environment characterized by a high level of input uncertainty. These results are consistent with findings from other studies undertaken in the same industry [12,10]. In the next step of the analysis, attention was drawn to the attributes (strengths and weaknesses) that was central to explaining the performance differences by comparing the groups along three dimensions related to raw material uncertainty—raw material quality, raw material price, and capacity utilization.

5.1. The best performers exploit opportunities and avoid threats

An important finding was that the best companies have chosen a raw material strategy based on a large proportion of fresh raw materials delivered from hook gear (handlines and longlines).

These firms are able to exploit the opportunity formed by geographical proximity to rich fishing grounds. At the same time, they avoid being hit by the threat of raw material competition from international players who buy frozen raw material. They also reduce the threat represented in raw material competition from conventional businesses by acquiring small and medium sized fresh fish.

5.2. Low capacity utilization affects all companies

Another issue studied was the extent to which firms managed to stabilize raw material supply throughout the year, thus achieving good capacity utilization in production and thereby improved profitability. It turned out that all performance groups utilized a raw material which is based on a season-based fishery, but that they managed to curb the volume fluctuations of the main species of cod by switching to other species throughout the year. In this

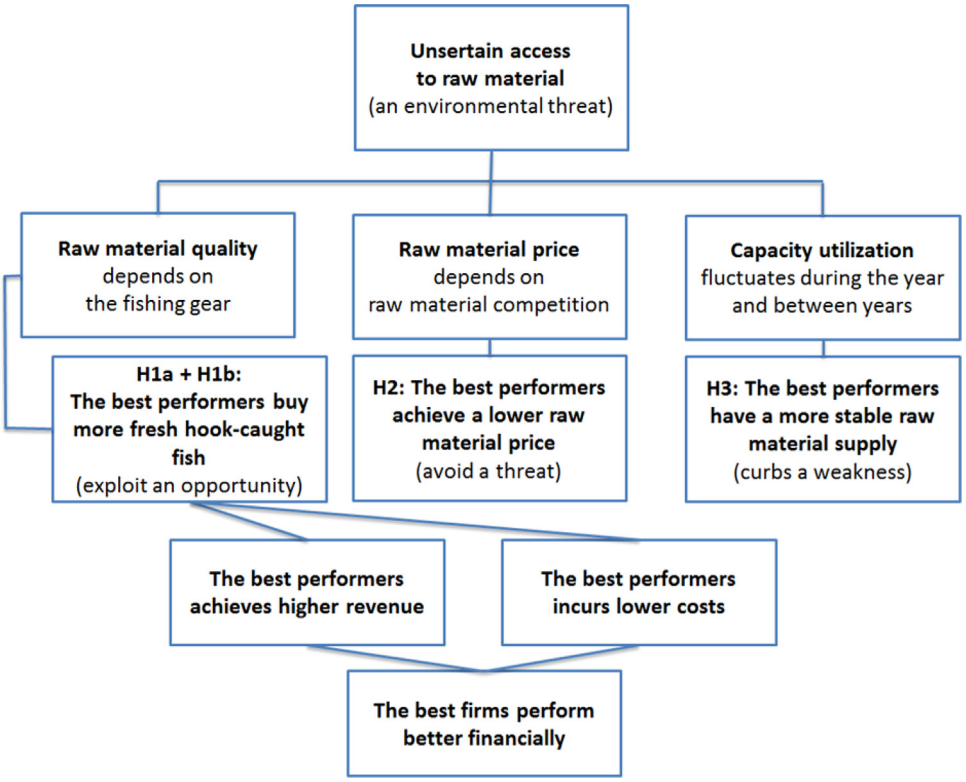

Fig. 6. Analytical model and empirical findings related to valuable attributes of the best performers.

way, companies have partially managed to deal with variation in availability and achieved improved production continuity.

In Fig. 6 the attributes that characterize the most profitable companies are summarized. Through strategic choices, the best performance group demonstrated that it is aware of the threats and opportunities in the competitive arena. This is in line with Porter's [37] environmental theory. By observing the changes on the raw material market, they have managed to turn the focus to fresh supplies from hook gear and been able to utilizing the localization advantage that proximity to such raw material provides. For firms in an industry characterized by fierce competition, this may be crucial for profitability and survival.

Nevertheless, it can be challenging to turn production to fresh deliveries. Lorentzen et al. [30] comment on two issues: regular supply of raw materials and high degree of freshness and quality. In the analysis, it was observed that some companies who shifted production towards fresh raw materials disappeared from the population, while companies that had a higher proportion of frozen raw material survived. The choices made must therefore be based on what resources each company has available and how individual managers perceive and respond to environmental change. Therefore, imitating the fresh fish strategy of the best companies is not sufficient to achieve profitability.

6. Implications

The findings reported can provide businesses with knowledge about how to achieve improved profitability in the fillet sector. The results may also contribute as input to management decisions aiming to improve the fillet companies' framework conditions.

The industry implications of the findings are in line with the expectations. In this respect, the study does not provide many surprises. However, the study is a systematic and rigorous empirical documentation of possible explanations of variations in profitability in the fillet industry.

By drawing their attention towards fresh raw materials, the fillet businesses can increase their profitability, though such a raw material strategy is not easy to implement. The most profitable fillet companies have an impressing part of their supply from coastal vessels with hook gear. However, this fleet has been reduced in recent years [22], because the profitability of this fleet is much improved when other types of gear are used and the fishing season is intensified. The most successful fillet businesses face a dilemma: how can they stop the escape from hook-gear without having to raise the price of raw materials so that they lose the scarce margin they have today?

The fillet companies have always had great political legitimacy in Norway [16]. The production is labor intensive and located close to fishing areas with few alternative workplaces, particularly for women. The strong legitimacy has provided a basis for designing specific measures not only to increase the profitability of fillet production, but also to create employment and contribute to the settlement pattern [23,20]. The trend of development in the fillet industry shows that this has not been a success. The decrease in the number of businesses, employment and profitability demonstrates an industry facing rough weather.

A key instrument has been to apply cod trawlers to reduce the uncertain supply of raw materials. This is made possible by granting land plants an exception from The Participation Act by allowing them to own their own vessels. In recent years, this is reinforced by imposing trawlers both supply and processing requirements. However, the findings show that the best performing fillet companies, to a lesser extent receive raw materials from such vessels than the other firms do. The effect of this policy instrument may therefore be questioned. Have the best performing fillet companies achieved this position in spite of the fact that they are not favored, or because of the lack of an apparent failured policy?

The use of cod trawlers and the delivery obligation can be out of date by both technological and commercial reasons. Perhaps attention should be paid to how the plants can be supplied by fresh fish of high quality throughout the year. The quality from fresh fish deliveries supplied by trawlers is not good enough to support the fillets companies. Moreover, financial incentives are forcing trawlers into a concept with onboard freezing. Cod trawling and production of fresh fillets thus seems to be two production concepts that have grown apart.

Findings indicate that the financially most successful raw material strategy for the land plants in recent years has focused on fish of good and consistent quality, that is, small and medium sized hook caught fish. Biologically, fish migration creates a seasonal catch pattern. For the companies it becomes imperative to develop valuable properties that can enable them to meet this challenge. This can be accomplished in several ways. Costs can for example be reduced during periods of the year when activity is low. But this requires low startup costs when activity increases so that they don't lose on the swings what they gain on the roundabouts. Furthermore, the activity can be controlled based on the raw material at any time available.

New technology can make the companies less vulnerable to seasonal fluctuations in raw material supply. One strategy might be to capture, transport, and store the catch alive. This may reduce the uncertainty associated with quality and volume, and contribute to supply the markets continuously. Such a raw material may also be suitable for other product variants, and it will be available to fillet companies close to customers in many key exporting countries.

Although technological innovations can reduce labor costs, stabilize raw material supply, and raise the raw material quality, it cannot, however, eliminate what has always been the main challenge for the companies—they must perform well financially in order to compete both locally and globally for the best raw material. It is likely that also in the future, attributes of the fillets companies' raw material suppliers will be an important source of competitive advantage.

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