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## Globalization and the Development of Industrial Clusters: Comparing Two Norwegian Clusters, 1900–2010

This article explores how clusters have reacted to the recent process of globalization by comparing the development of two clusters that are located in the same region, the county of Møre og Romsdal in Norway. These two clusters are the furniture cluster and the maritime cluster on the west coast of Norway. When international competition increased, the first one declined while the other prospered and became more global. Structural differences explain only partly the different development paths of these clusters. In addition, firms' strategic actions and the degree of collectively shared visions about international operations mattered for how the clusters developed.

The development and character of industrial clusters have had a strong impact on the formation of modern capitalism worldwide. Since the 1990s, in particular, many local industrial clusters have been challenged by globalization and have experienced dramatic changes. Some clusters have declined, and others have taken advantage of the new international opportunities and continued to grow.<sup>1</sup> One example of this is the development of two industrial clusters in the same county, Møre og Romsdal, on the west coast of Norway: the maritime cluster, which grew from a local cluster to a strong international cluster in the period of globalization from the 1980s onward, and the furniture cluster, which disintegrated in the same period (Figure 1).

[Fig. 1 about here]

The area, which has five percent of Norway's population, emerged as the center of these two different industries in Norway during the 1900s. From the 1920s onward, the southern part of the county, Sunnmøre, took the position of the most dynamic and most important Norwegian district for the industrial production of furniture.<sup>2</sup> Since the 1950s, no other region in Norway has matched it. During the first part of the twentieth century, moreover, the local shipbuilding industry evolved as one of several regional maritime agglomerations in Norway, a development closely linked to the expansion of the deep-sea fishing fleet in the same area.<sup>3</sup> During the 1970s the maritime industry was the dominating and most dynamic regional agglomeration within this field in Norway. From this basis of comparable strength and high national importance, the two clusters developed differently in the following period. In 2007 the Norwegian maritime industry employed 37,000 people in total, and turnover was NOK 105 billion (US\$ 20 billion). The maritime cluster in the region represented roughly 50 percent of these figures. The furniture industry, however, employed only 2,430 in the mid-Norway area, which Møre and Romsdal dominated for furniture, and the turnover was approximately NOK 5 billion (US\$ 0.9 billion).<sup>4</sup>

The unequal development of two clusters in one geographical area makes this an interesting case for studying the effect of recent globalization on regional development. Generally, business historians have contributed greatly to the understanding of the dynamic development of industrial clusters, as shown by historian Jonathan Zeitlin's chapter in *The Oxford Handbook of Business History* (2008).<sup>5</sup> Since 2008 research has added more knowledge to the understanding of the creation and growth of clusters by studying topics like the rise of the Spanish canned fruit and vegetable clusters, the tourism cluster in Majorca, the role of

family firms in the Sheffield cutlery district, and steam power's impact on the creation of German clusters.<sup>6</sup> Tomoko Hashino and Takafumi Kurosawa added new knowledge to the question of cluster governance by researching the role of Japanese regional trade associations, and Montserrat Llonch-Casanovas shows in a study of trademarks in Catalan knitwear the usefulness of comparing industrial districts.<sup>7</sup>

The question of why clusters have developed differently as they have been integrated into the global economy has so far mainly been studied from the perspective of economic geography.<sup>8</sup> Nevertheless, historian Jonathan Zeitlin argues that historical studies show that successful responses to globalization have been based on more formalized collaboration among economic actors within clusters, while this element has been much weaker in disintegrating clusters.<sup>9</sup> Like Zeitlin we will argue here for the usefulness of including contributions from economic geography in studies of cluster resilience, and consequently follow up his recommendation for a “productive dialogue” between these two streams of literature, which business historians Andrew Popp and John Wilson have also alluded to.<sup>10</sup> In line with economic geography we will argue that individual firms will be heavily affected by processes at a regional level, while our institutionally oriented approach implies that firm-based strategies will feed back to institutions and structures and eventually decide the outcome of the reaction to globalization.

The comparative analysis is structured as follows.<sup>11</sup> In the next section we discuss how the contribution of the economic geography and strategy literature can enhance the business history analysis of clusters. Then we analyze the formation of the two different clusters in the same area, and how they evolved into two central clusters at the national level. The following sections focus on how these clusters became part of the global economy from the 1970s onward and are followed by concluding remarks. The article is based on archival work supported by information from a rich local history literature on these two industries in the region.

### Perspectives on Cluster Development

According to Michael Porter, strong clusters are characterized by a demanding and competitive environment at the regional level with strong linkages among firms, suppliers, customers, and related industries and institutions.<sup>12</sup> A combination of competition and cooperation, including the sharing of knowledge between firms, is an essential upgrading mechanism, and specialized factor conditions (skilled labor, capital, and infrastructure)

contribute to the competitiveness of the cluster. In line with this perspective, historian Håkon With Andersen has shown that supporting institutions have made a strong contribution to the innovation and transformation of the maritime cluster in Møre og Romsdal since the 1970s. These supporting institutions (insurance and ship classification societies, brokers, consultancies, and research institutions) together with the maritime industry created a maritime complex.<sup>13</sup>

Another stream of economic geography literature is more concerned with the explanation of cluster development over time and through life cycles.<sup>14</sup> In this perspective, clusters develop over time through different phases such as emergence, growth, sustainment, and decline or death.<sup>15</sup> The life-cycle literature has searched for general societal laws with a biological connotation and has been inspired by evolutionary theories in natural sciences.<sup>16</sup> The later development of a cluster thus depends on path-dependencies that can be traced back to its emergence and growth phases. These path-dependencies create trajectories for further development. Clusters can also be “locked in” by socioeconomic conditions that were once comparative advantages.<sup>17</sup>

Seen from a business history perspective, with its strong tradition of researching the behavior of individual and collective actors in processes of change, this life-cycle tradition might be considered deterministic and accordingly less relevant. Andrew Popp and John Wilson, for example, have claimed that cycle theories tend to be deterministic. Based on their studies of the development of English industrial clusters, they argue for a non-deterministic life-cycle model that can be applied as a methodological tool and not as a theory. For example, lock-ins that once contributed to the creation of the cycle are idiosyncratic, are not given, and are thus the results of “choices made and not made.”<sup>18</sup>

Recently, several scholars within economic geography and regional studies have searched in the same vein for more idiosyncratic explanations to the different development tracks of clusters, and these searches should be welcomed as a response to the business historians’ request for a “productive dialogue.” For example, Raphaël Suire and Jérôme Vicente argue that the reason why some clusters decline and others grow as they enter the period of globalization has to do with the fact that some clusters are resilient and some are not. A resilient cluster is one that has developed adaptive abilities to resist external shock.<sup>19</sup> Fiorenza Belussi and Silvia Rita Sedita have studied the development of Italian industrial districts, and shown that instead of following standardized life cycles, the different districts followed a multiple growth pattern.<sup>20</sup> Our article aims to develop this dialogue between business history and

economic geography, building on Popp and Wilson's perspective of life cycles as well as exploring Jonathan Zeitlin's observations that in the period of globalization, the development of clusters has been increasingly based on a formalized collaboration among actors.<sup>21</sup>

### The Formation of Two Industrial Clusters

The first part of the twentieth century up to the 1970s was a period of formation and development of both the maritime and the furniture clusters in the region. The formation of the maritime cluster was closely linked to the development of the region's shipping and fisheries business from the late nineteenth century, which shows the strong vertical links between producers and customers.<sup>22</sup> Historically, the area had developed a rich tradition for shipbuilding, fishery services, and coastal transport. Small yards worked closely with skippers and ship owners to satisfy the need for specially designed boats and equipment that were fit to operate under different local sea and weather conditions. The dispersed and local ownership of ships and yards implied that many fishermen owned shares in their boats together with neighbors and relatives.<sup>23</sup>

Coastal societies in Norway were reluctant to adopt industrialized fisheries that were based on the British models from the late 1800s. The British system was a "steel and steam" system, concentrated in larger industrialized cities with a proletarian class of fishermen who did not own boats or equipment. Fisheries were based on larger trawlers operating on the deep seas in different parts of the world and having little relation to coast-based fisheries. Obviously, the Norwegian coastal and seasonal fishery carried out with the "wood and sail" system could not be competitive in the long run. However, by introducing small motors that were fitted into smaller wooden boats that were modified to operate in different seasonal fisheries, the "wood and motor" system evolved as a pillar in a gradual modernization of the fisheries. This modernization included the gradual development of larger boats with larger machinery and deck technology, which would in the end be suitable for deep sea fishing.<sup>24</sup>

New shipyards grew up in the town of Ålesund and Vestnes municipality in the 1860s to produce vessels for fishing on the North Sea coasts and even for exploring fishing in Iceland and the Faroe Islands. Yards subsequently grew up in Ulsteinvik and other villages before the 1920s, making clearly visible the trend of a gradual transformation of the fishing fleet in the 1920s and 1930s.<sup>25</sup> In the 1950s and 1960s the region emerged as the leading maritime and marine region in Norway, with strong ties among fisheries, related yards, mechanical

workshops, and equipment producers.<sup>26</sup> Skippers were also owners of deep-sea fishing vessels to a larger extent than in any other area of Norway. They continuously experienced the need for improvements and conveyed their ideas for innovations to the yards upon their return from the various fishing fields. The yards, banks, and other supporting institutions trusted these ideas and with the skippers they took substantial financial risks to begin modernizing the fleet. These networks knitted diverse actors together in cluster-like relations. Many fishermen worked at the yards between seasons, and mechanical workers were employed in fisheries. These shifting employment relationships within the system promoted the spread of new ideas and solutions from the yards and equipment producers to the fleet deployed in the fishing fields. They laid the foundation for the revolution based on steel vessels for deep sea fishing that took place during the 1960s and 1970s.<sup>27</sup>

The “wood and motor” era came to an end in the 1960s with the breakthrough in steel hulls. The transition to steel vessels was accompanied by innovations in electronic instruments for detecting fish (sonar/asdic).<sup>28</sup> Although the combination of technologies initially led to soaring catches and output in the herring sector, the technologies had a distinctly generic character and affected all deep sea fishing. The use of new ring nets and power blocks and the development of new propulsion systems (side propellers) totally revolutionized the pelagic sector in terms of geographical range, catch, and output. The transition to steel hulls catalyzed this revolution. In the late 1970s, another breakthrough extending fishing range and flexibility was the development of the combined ring net and trawler, made possible through the construction of the stern as a lateral axis.

Returning to the furniture industry, in 1908 the first furniture company opened in Sunnmøre, which became a regional center for furniture production in the 1920s.<sup>29</sup> Over the next three decades it went from a marginal source to become the most important and dynamic Norwegian furniture district. This expansion has been interpreted as a reaction to the economic crises in Norway in the 1920s and 1930s, and Norwegian historians have used it as an example of how entrepreneurs confirm Schumpeter’s theory on creative destruction by creating new activities in crisis.<sup>30</sup> The establishment of several small-scale production firms was an attempt to do something creative in order to avoid unemployment and the other negative consequences of the economic crises. The founders were men from the region, many of them sons of small farmers of limited means, but the start-ups did not require much financial capital. Very often, these men started production in the basements of their own houses with no employees or only a few. The success of the furniture industry in the region is explained by two factors. First,

factory owners and employees came from the same rural communities, which meant the new factories were able to produce furniture at a lower cost, since the price of labor was substantially lower than in the cities where most furniture production had traditionally taken place. Second, the small factories were innovative, especially in introducing small electro-motors that favored small-scale production.

The accounts of how these two clusters emerged confirm the impression of an entrepreneurial and egalitarian culture in the region.<sup>31</sup> There were, however, some striking differences. While the maritime industry grew as a result of demand from the local fishing fleet, and consequently developed strong links with very demanding local customers from the outset, these vertical relationships were missing in the furniture industry. The furniture industry had no local competitive advantage apart from cheap labor. Suppliers were national or international, and customers came from all over the country.

However, during the 1950s, while production and the number of employees declined in the rest of the Norwegian furniture industry, these figures increased in this region.<sup>32</sup> New companies emerged, developed into a cluster, and contributed to the creation of a more demanding competitive environment. These horizontal relationships were also characterized by cooperation. For example, in 1956 four of the largest producers joined forces and established a joint export organization, Westnofa.<sup>33</sup> For domestic distribution, the company Johan Riise emerged as a dominating multi-firm distribution agency for most producers in the area. These developments strengthened the vertical relationships in the region's furniture cluster, but the impact of demanding local customers and suppliers was still weak compared to the maritime industry.

When we compare the furniture and maritime industries we see that, as early as the beginning of the 1950s, the furniture industry in the county had gained a dominating national position. According to a study made by the regional authorities in 1954, the furniture industry and the textile industry were the most important manufacturing sectors in the area. Of the 1,424 manufacturing firms in the county, 282 were furniture producers and they accounted for 18 percent of the manufacturing labor force. Out of 3,212 employees in the region's furniture industry, 914 were employed in Sykkylven and 456 in Stranda. These two municipalities were small micro-agglomerations of the furniture industry and employed 75–80 percent of the total workforce of the region's manufacturing industry.<sup>34</sup> The local maritime industry did not occupy an equally dominating position at the national level, but nevertheless it made a major contribution to the growth of the fishing industry. Being the dynamic center for the national



fishing industry, with supporting yards and an emerging industry in processing fish to make such products as fish oil, as well as having a long tradition in exporting (especially dried cod [bacalhau]), the region took a lead position in Norway's marine activities. As in the furniture industry, there were micro-agglomerations of small shipyards, such as the municipality of Vestnes, which had around three thousand inhabitants and where the majority of the non-agricultural population worked in small shipyards.<sup>35</sup>

During the 1970s, the maritime cluster in the region also emerged as the dominating cluster in Norway, as we will explore in the next section.<sup>36</sup> Its growth had also been strong in the 1960s, and from 1960 to 1970 the number of employees in the shipbuilding industry grew by 121 percent, from 2,088 to 4,537; at the same time employment in the building and maintenance of steel vessels grew by 365 percent, from 733 to 3,405.<sup>37</sup> Parallel to this development of the industrial structure, the establishment of stronger local and regional banks and area industry associations significantly expanded the institutional supports.<sup>38</sup>

In 1974 about 25 percent of the total industrial workforce in the region worked in the maritime industry, and about 14 percent in the furniture industry. In Sykkylven, 75 percent of the workforce was employed in the furniture industry, and in Ulsteinvik 93 percent in the maritime industry. For both industries, the horizontal links were strong, which is shown by the large number of local producers. In 1970 there were 38 shipyards and in 1974 there were 169 furniture companies.<sup>39</sup> The horizontal links were reflected in the way local firms cooperated and acted jointly, and not only as individual firms, for example, by establishing regional industrial laboratories in cooperation with the Norwegian Productivity Institute (NPI) and the semi-governmental technological consulting and training organization, Statens Teknologiske Insitutt (STI).<sup>40</sup> Regarding developing new technologies for maritime and furniture production these networks acted as important supporting institutions in the development of the two clusters.

One of the networks' key activities was to organize seminars and projects on different business administration and management topics, including how to improve regional vertical integration.<sup>41</sup> For example, in the late 1950s, 160 local firms from different industries participated in meetings and seminars on how to improve subcontracting within the region.<sup>42</sup> Vertical integration was one cluster-related dimension that revealed striking differences between the maritime and furniture industry clusters. The shipbuilding industry had developed close links to demanding local customers (in the fishing industry) and local suppliers of diverse equipment, including hydraulic winches from Hydraulik Brattvaag and compressors from Sperre in the local community of Ellingsøya in the 1940s.<sup>43</sup> In comparison the furniture industry

had few local subcontractors and suppliers of raw materials were primarily from outside the region.

Finally, both clusters were very innovative. In the maritime industry, several radical innovations made a huge impact on all sectors of deep sea fishing, shipyards, and related activities during the 1960s.<sup>44</sup> Within the white fish sector, the development of automatically driven long lines assisted with two of the most demanding operations in terms of the crew needed and the workload during fishing: the baiting of the lines and the hauling-up operation. The construction of sheltered decks facilitated the use of new forms of sterns and automatic hauling. Within the white fish sector, moreover, local entrepreneurs developed a compact factory trawler concept. All of these technological solutions represent “conceptual” innovations that enjoyed tremendous international success. It is fair to say that although some of these technologies imitated or refined ideas generated outside the region, the diffusion of new technology within the county was unmatched in any other area. Thus, Møre og Romsdal evolved as a significant national maritime center.

In the furniture industry, this region again was the most productive and innovative in Norway in the 1960s and 1970s. The manufacturers were pioneers in introducing standardized production methods. They also developed new technology to produce laminated furniture. In 1971 the company Sandela in Sykkylven introduced technology to form-cast foamed plastic on metal frames, which revolutionized the production of stuffed furniture. From the 1950s onward, more and more local companies began to cooperate with designers to develop new models of furniture. This movement resulted in some successful models on the Norwegian market, like *Siesta* (produced by Vestlandske) and *Laminette* (produced by Møre Lenestolfabrikk). In 1971 Ekornes launched the *Stressless* armchair, a brand that was marketed in *Stressless* shops in several European, Asian, and American countries from the 1990s onward. In 1972, Stokke announced its *Tripp Trapp* highchair—“the chair that grows with the child”—designed by Peter Opsvik, a chair that has also had tremendous international success.<sup>45</sup>

According to professor of business strategy Julian Birkinshaw, dynamic clusters with high innovation activities have tended to respond more positively to globalization than less dynamic business clusters.<sup>46</sup> From this perspective, both clusters should have been prepared to enter the global economy, but, as we will see, the maritime cluster managed better than the furniture cluster.

## Responses to Globalization in the Maritime Cluster

The maritime industry in Møre og Romsdal was substantially transformed during the 1970s. While in other parts of Norway this industry suffered from the global oil crisis of 1973, the local industry was transformed and strengthened as a cluster. The shipyards were relatively small and flexible, with local owners, and they could, for example, easily move from producing ships to repairing them. More important, however, was their ability to innovate and develop new fishing vessels and equipment, as well as respond proactively to the need to construct supply ships to serve the new oil and gas fields in the North Sea.<sup>47</sup> Offshore supply vessels (OSVs) are fairly small boats that are required to operate in very similar conditions as fishing vessels, and the local shipyards applied their experience of fishing fleets more or less directly to the new OSVs. During this process the linkages to the national technical university Norges Tekniske Høgskole (NTH) and its research organization (SINTEF) as supporting institutions were strengthened. The family firms' need for financial capital to expand was met by the merger of the local bank, Sunnmørsbanken, with a national bank, Kreditkassen. The climate for cooperation improved as many actors realized that there was a need for tighter cooperation to counteract downturns in the fisheries and shipbuilding. A formal expression of this was the transformation of the regional business association of yards, Vestlandske fartybyggerlag, into an agency for marketing and financing new ships.<sup>48</sup> Here we focus on how the actors in the cluster increasingly acted jointly in the process of innovation and internationalization as if they were following a meta-strategy at cluster level. We argue that, in order to understand the dynamic development of clusters, it is not only decisions at the single-firm level that should be consulted, but also behavior that represents shared thoughts and visions among the members of the cluster. This meta-perspective is inspired by two researchers in regional studies, Marco Bellandi and Annalisa Caloffi, who define meta-management as a local governance mechanism that formulates shared visions and suggests strategies and actions based on a collective diagnosis and taking into account the interests of the actors in the cluster. These visions, diagnoses, and strategies may be expressed explicitly or act as hidden norms for action.<sup>49</sup>

The local maritime industry had already become involved in international activities in the 1950s. Hatløy Verkstad built vessels for the Faroe Islands in the 1950s for line fishing, and the company Ulstein built line vessels and ring net trawlers for Iceland in the 1960s.<sup>50</sup> Another key company, Hydraulik Brattvaag, produced hydraulic winches at a unit in Spain from 1971 onward.<sup>51</sup> In other words, some actors already had international experience when the industry

was challenged by crisis in 1973. An expression of meta-management in this period was a business trip that several small yards and suppliers organized to the Faroe Island in the early 1970s to promote export.<sup>52</sup>

From the mid-1970s to the mid-1980s, the demand for new fishing vessels declined substantially, which affected the entire cluster, shipbuilding as well as equipment producers.<sup>53</sup> The fisheries were heavily exposed to the reduction in the number of species and to national and international regulations to counteract overfishing. However, new fisheries were established, and the state policies launched to cope with this crisis stimulated a renewal of the fishing fleet. In the dawn of globalization, the maritime complex in the region began to become international in response to the challenges. One of the earliest internationalization processes in terms of foreign direct investment (FDI) took place in the late 1970s, when Sjøvik, one of the fishing companies in Romsdal, established a subsidiary in Grimsby, U.K., which distributed frozen fillets from the company's factory trawlers to the European market. The same company extended its foreign operations in the mid-1980s. By building a new factory trawler, they took on a risky shell-fishing operation in the Barents Sea. The fishery collapsed, however, and a very innovative move was launched, establishing new shell-fishing methods in Canada. This operation turned out to be a success, owing to the export of regional know-how and reverse knowledge transfer from foreign operations, which had long-term effects.

Drawing on local knowledge as well as international experience Sjøvik widened its global operations. The internationalization of the ship design segment in the cluster furthered this expansion. Based on a regional design, sold by some of the ship design consultants within the cluster, a substantial number of modern fishing vessels were built for companies in East Germany and Russia. The companies lacked the competence to run the fleet, however, and Sjøvik operated the fleet from the local headquarters in Romsdal, drawing on its experience operating in various international fisheries including in Argentina and Canada.<sup>54</sup>

A diminishing cod population and national regulations imposed on cod fishing from the mid-1970s hindered the factory trawler companies' efforts to modernize the fleet and build new vessels. However, optimistic forecasts for future cod fishing as well as relaxed regulations led to a substantial renewal of the fleet in the mid-1980s. The forecasts were wrong, and from the late 1980s the modernized fleet of factory trawlers was forced to explore global fisheries. By 1990 40 percent of this fleet operated in areas like the Falkland Islands, Oman, Argentina, New Zealand, Australia, South Africa, and Canada. This global move was strongly supported financially by the regional office of the bank Kreditkassen in Ålesund. In general actors who

internationalized their activity could lean on the cluster infrastructure, not least the strengthening of regional financial institutions through bank mergers and the creation of a new bank, Sunnmørsbanken, in 1975.<sup>55</sup>

The regional concept of designing smaller, compact factory trawlers emerged, as mentioned above, as a key factor in the cluster's success. The ship design consultants established a profitable market for this concept, and in fact from 1983 until 1992, 85 factory trawlers were built for companies in the U.S.S.R., Canada, the United States, the European Union, and other countries, based on the regional design. From 1985 to 1990, almost 100 percent of the regional capacity for shipbuilding was engaged in building factory trawlers. Despite the crises, by the mid-1980s Møre og Romsdal had become Norway's leading shipbuilding center. Regional entrepreneurs established operations in the United States, and even constructed a new American fleet for crab fishing. The regional shipyards were also heavily involved in this construction.<sup>56</sup>

Thus, there was a distinct pattern, in this early phase of internationalization, of entrepreneurial decisions materializing within a wider cluster framework of supporting institutions. Moreover, the well-developed and complete cluster structure and diverse mechanisms for innovation, cooperation, and competition led to the upgrading of the entire cluster. International knowledge transfer played a vital part in this upgrading. The entrepreneurs engaged regional resources in this internationalization because they had a developmental perspective. Developments within the new OSV segment further strengthened this trend. Although some vital technological steps emanated from more top-down vertical relations, the horizontal networks within the regional geographical scope were, in general, more important, and were essential in order to take advantage of global opportunities. For example, at the end of the 1980s, when oil wells were found in Brazilian territory, in very deep water, some shipping companies in the cluster saw the opportunity to build vessels for these operations.<sup>57</sup>

The offshore networks that largely formed the OSV segment in the region were, from the outset, international. The local networking was paramount, insofar as shipowners built their first OSVs using knowledge transferred from deep sea fishing and expertise in building vessels for this sector, which meant that there was both knowledge-based and production-based capacity in the region for beginning petroleum-related activity. Moreover, some of the design companies transferred vital knowledge into the local networks through their international operations. Through this process the shipyards developed new knowledge that was essential for local innovative projects.<sup>58</sup> This was an important move for the cluster's development, as

otherwise many of the larger shipping companies in this phase would have ordered vessels overseas.

However, the offshore vessel sector was struck by heavy crises in the early 1980s that peaked in 1983 and 1986. In 2002 the shipyards experienced a serious new crisis stemming from an overly strong Norwegian currency, accompanied by wage increases and a reduced regime of state support. They declined in competitiveness and lost market share to shipyards in Asia and Eastern Europe. Employment fell from 5,500 to 3,800 in 2002. As in the 1970s, this crisis also led to a renewal and to a deeper involvement in the global economy for the maritime cluster. The shipyards in the cluster restored their competitiveness through substantial investment in modern production facilities, updated technology, upgraded competencies, and stronger and wider market networks, as well as intensified cooperation within the cluster. Norwegian shipyards captured new markets and market share. In 2010 there were thirty offshore OSV companies and a world-leading community of ship design consultants who brought many international contracts to Norwegian shipyards.

In general, the soaring demand from Asia for the building of ships and offshore vessels led to a growing demand for Norwegian shipbuilding from around 2000. In particular, industrial growth in China created a fast-growing demand for ships and for equipment for offshore petroleum-related activities. In 2004, the world fleet of supply service vessels amounted to approximately 2,000 ships, 270 of them operated by Norwegian companies that mostly belonged to the cluster. From 2004 to 2006, twenty five Norwegian shipping companies contracted to build such vessels for a sum of NOK 41 billion (US\$ 6 billion), and 56 percent of these new orders were granted to companies in the cluster. In 2004, more than 50 percent of the new ships for which contracts were signed across the world were ordered by Norwegian shipping companies.<sup>59</sup>

Offshore shipowners in the cluster doubled their revenues from 2002 to 2006, with the earnings almost exclusively coming from markets outside the North Sea.<sup>60</sup> The growing international demand for OSVs was met by transforming several local companies to multinational enterprises (MNEs). High labor costs made it difficult to maintain production capacity in Norway, and most of the production of hulls was outsourced to eastern European transition economies, like Poland and Romania, from the late 1990s. Some firms, like Ulstein, based their production offshore by using strategic partners in countries like China, Brazil, and Spain. Others like STX established subsidiaries in, for instance, Romania, France, Ukraine, and Vietnam.

From the 1970s to 2010 the maritime cluster was transformed from a local cluster serving the fishing industry to the most international business environment in Norway. For example, among Norway's nineteen counties none exported as much per capita as Møre og Romsdal did in 2011.<sup>61</sup> A survey shows that in the Shanghai region in 2011 there were sixteen subsidiaries of Norwegian firms that had their headquarters or a strong presence in Møre og Romsdal.<sup>62</sup> While the internationalization of the local yards was originally motivated by cost, the motives have become more complex. The industry wanted to be located in global hubs like Shanghai and Rio de Janeiro, and there was a strong element of meta-management in the decisions to enter these two locations. One CEO said about the local investments in Brazil from the 1990s: "A vision or idea was developed horizontally among shipping companies, shipyards and equipment producers."<sup>63</sup> Companies also searched for core competencies, which was the motive behind Ulstein's acquisition of Sea Solution of the Netherlands in 2008.<sup>64</sup> The international MNEs that entered the cluster by acquisition were also seeking competencies. Global actors such as Rolls Royce, Aries, Trieste, Bourbon, ABB, and STX became major players within the cluster from around 2000, and they acted as institutional players, supporting research and development and competence building in the region.<sup>65</sup>

### Responses to Globalization in the Furniture Cluster

While the maritime industry experienced a radical shift in the international competitive environment in the 1970s, the furniture industry had already been gradually exposed to international competition from the end of the 1950s. In 1953 the value of imported furniture was only one percent of the value of total production in Norway. The value of exports was just half of one percent. In 1960 the value of imports was still only 1.5 percent, but from the mid-1960s this figure began to increase substantially, from 3.5 percent in 1965 to 16 percent in 1970.<sup>66</sup>

Challenges were met by a proactive approach. The new competition was foreseen before Norway became a member of the European Free Trade Association (EFTA) in 1960. The furniture industry was more positive about the possibilities of reaching new markets than other industries that produced for the domestic market.<sup>67</sup> Even in the 1950s several important decisions and actions that expressed elements of an internationalization strategy were taken at the cluster—and not at the firm—level; for example, in the establishment of Westnofa in 1956. Most importantly, the producers joined forces to go abroad and search for new knowledge. In

1966 a group of more than ten furniture producers from the region, including Ekornes, the largest, went to the United States on a study tour to obtain new knowledge and to meet foreign competitors.<sup>68</sup>

Two companies in the cluster also became small MNEs in this period by establishing production units abroad; these were Stokke in Spain in 1972 and Slettvoll in Malaysia in 1977.<sup>69</sup> The main international strategy of the cluster firms was, however, to continue their joint efforts from the 1950s to promote exports. More and more the cluster served as a unit for important strategic actions taken to globalize. The efforts to increase exports only partly paid off. From 1970 to 1975 exports doubled in value, from NOK 121 million to NOK 219 million. However, imports more than tripled, from NOK 164 million to NOK 527 million.<sup>70</sup> The industry increasingly feared that it would be lagging behind its competitors in Sweden, Denmark, Germany, France, and Spain, meeting the same external pressures that had largely destroyed the textile industry in the region. Many feared that eastern European countries might also develop into new competitors.<sup>71</sup> Even in the domestic and regional market, Danish and Swedish firms captured a steadily growing share. A local branch of the national furniture industry association, Møbelprodusentenes Landsforening, and the STI took on the task of investigating the apparently competitive advantage of the Swedish and Danish producers abroad and in the Norwegian market. A project group consisting of representatives from businesses, the STI, the NPI, labor unions, and county authorities was formed with the aim of seeking new knowledge in different European countries to prepare for the anticipated crisis. The senior officer at the STI, Peder Myrstad, was the leader of the group, which actually split into several project groups supported by the governmental financial institutions Distriktenes Utbyggingsfond and Industrifondet.

The project group made several study trips, first to Scandinavian corporations, and then to Germany, France, and Spain.<sup>72</sup> The group tapped diplomatic channels to get access to the leading companies. The visit to German companies, which had to be upgraded to an official bilateral meeting between industry attachés from Germany and Norway in order to take place, demonstrated, in particular, that Norwegian companies lagged behind technologically, especially in the application of computerized laser technology in the production process. This technology allowed great savings in material costs, labor costs, and throughput, in addition to raising quality. This impression was confirmed by visits to the French multinational corporation Lectra, the leading producer of this technology, and the Sunnmøre furniture companies realized



that they were compelled to invest in it. However, none of them had anything near the financial capacity to introduce this new technology to the region.

The modernization process thus rested heavily on the cluster level and on a cluster-oriented corporate strategy, as shown by the following process: Through a cooperative venture, ten producers established a common laser-based production unit in the regional center of the furniture industry, Sykkylven. Moreover, Lectra moved its Scandinavian head office to Sykkylven to reap the benefits of the cluster's ability to facilitate knowledge flow and the dissemination of technology. The cooperative venture and the establishment of Lectra in the cluster in 1984 marked the start of a project lasting from 1984 to 1987, called Møbeldata. Through this project, Lectra's technology was refined and adapted to the local production facilities. After a few years the new technology was adopted and more widely diffused in the region, and the local producers far outperformed their foreign competitors in the local market and advanced in international markets.<sup>73</sup> In these years, production increased, as well as the importance of exports. While the value of exports was 14 percent of total production in 1980, it rose to 18 percent in 1984 and 22 percent in 1989.<sup>74</sup> All the major producers, including Ekornes, had to cooperate to get access to the new technology; it would have been too risky and too expensive for firms to invest in the computer-based technology on their own. Thus, it is fair to say that it was the cluster that reacted to the growing external pressure, and not the individual companies.

The firms in the furniture cluster met the international challenges of the 1970s by collectively searching abroad for new technology to adopt to increase exports. While the cluster's key firms had reacted collectively to both emerging global competition in the 1960s and new technological and market challenges in the 1970s and 1980s, that was not the case when global competition increased during the 1990s. Instead of firms reacting jointly, two different internationalization strategies crystallized: one was to send production offshore to low-cost countries; the other was to improve exports by introducing advanced robots to save labor costs.

Five firms chose the strategy of sending production offshore in the late 1990s, investing in Thailand, Estonia, and Lithuania.<sup>75</sup> Tougher international competition led these firms to set up factories offshore, as illustrated by some figures on how the Norwegian furniture industry became more integrated into the global economy. The value of furniture imports increased from NOK 2 billion in 1989 to NOK 6 billion in 2000; the value of exports increased from NOK 0.6 billion to NOK 2.9 billion in the same period. If we take the investments in Lithuania as an

example, it is clear that the main motive for this was cost reduction, since Lithuanian workers' wages were 15 to 20 percent of wages in Norway. Structural similarities between the Norwegian and the Lithuanian furniture regions suggest that the subsidiaries had the potential to use Lithuania as a new source of knowledge. But in practice, the subsidiaries copied the routines of the Norwegian production system: "The furniture producer has established a copy of the factory in Norway," a newspaper wrote of one company.<sup>76</sup> The subsidiaries not only copied production but also the idea of agglomeration. Four subsidiaries from the cluster started production in the same industrial park in Lithuania, which was therefore known as "Little Sunnmøre."

This case tells us two things. The first is how strategy changed in a period of strong external pressure, from searching abroad for new knowledge to searching abroad for lower production costs. The second is how strategic actions shifted from the cluster level to the corporate level. According to the national association of the furniture industry, firms cooperated less within the cluster, and it said in a report in 2003 that "the activities within the different regional groups of producers has [sic] decreased over the last years."<sup>77</sup> While Hjellegjerde and some other companies chose the international strategy of offshoring production and partly closing down production in Norway, the largest actor, Ekornes, decided to strengthen its presence in Norway and sell its foreign subsidiaries. In 1984 and 1985 Ekornes had transformed to an MNE by acquiring one Swedish and one German producer, but it discovered after a few years that it could not manage to develop its organization into a successful MNE. The foreign units were sold, and from 1994 all production units were in Norway.<sup>78</sup> The new international strategy was one of growth through exports, based on highly robotized production to save labor costs. These contradictory strategies reflected the breakdown of the cluster as a unit for strategic action.

## Conclusion

The two industrial clusters emerged in the same region and in the same period at the beginning of the twentieth century. When international competition increased in the 1960s and 1970s, they were both dynamic and proactive, but when the depth and speed of globalization changed in the 1980s, they reacted differently. The furniture cluster declined while the maritime cluster developed from a dynamic regional cluster to one strongly embedded in the global maritime offshore vessel industry.

Both clusters were originally innovative and open to change. The horizontal links between producers of ships and furniture were strong and were characterized by both competition and cooperation, which was expressed in joint initiatives and knowledge sharing within a relatively small geographical region. There were also, however, structural factors that were different. From the very beginning, the furniture industry had much weaker vertical ties to both suppliers and customers. The emergence of the furniture cluster was built on cheap and skilled labor as the most important specialized factor, not on the existence of local suppliers or raw material. The customers were consumers from all over the country, and the regional furniture industry had, with some exceptions, limited control over the distribution system.

Even in its formative period the maritime cluster appeared to be a more complete cluster. In the local maritime complex, local suppliers of equipment, yards, fishermen who demand high quality vessels, and supporting institutions were tightly interwoven, as has been shown by the historian Håkon With Andersen.<sup>79</sup> Because of the strong vertical relationships in the maritime cluster, demanding customers served as the main driver for internationalization. The customers, especially the deep-sea fishing fleet and later the offshore companies, always functioned as drivers of modernization. When customers became international, the maritime industry followed. This process was strengthened by the emergence of new markets, especially in Asia, and by foreign MNEs investing in the region to get access to local competencies. The driver for the internationalization of the furniture industry, however, was the need for cost savings. The export of furniture increased gradually from the 1960s onward, but the industry lacked a strong united group of demanding customers. When the industry spread internationally by establishing production abroad around 2000, the geographical localization (Lithuania, Estonia, and Thailand) was decoupled from the market (Scandinavia, Germany, and the United States).

We could say that there were structural features characterizing the two clusters that support the argument from the economic geography tradition that endogenous institutional factors dating back to the emergence of the clusters created a situation of lock-in that strongly influenced the development of their life cycles at a later time.<sup>80</sup> However, there are also factors affecting these two clusters that show a much more dynamic and unpredictable development track. One observation in this respect concerns the development of supporting institutions. In the 1950s and 1960s, both the local furniture industry and the maritime complex were part of a regional network that was unique in Norway for developing an informal and flexible regional system of testing, consultancy, and training.<sup>81</sup> From the 1970s the maritime cluster became much more strongly involved in research and innovation networks, especially with the technical

university in Trondheim (NTNU) and the SINTEF research center, as well as the global classification society for ships, DnV.<sup>82</sup> In 2010 the local maritime industry financed five professors at the local Ålesund University College, where several MSc programs in marine and maritime disciplines were offered. In 2013 the local cluster organization, the National Center of Excellence, Maritime, was one of two (out of twelve) cluster organizations in Norway that were upgraded to a Global Center of Excellence.<sup>83</sup> The furniture industry had no such center and struggled from the 1990s onward to offer one class for the furniture industry at high school level.

Another observation is that the development of these two clusters was also affected by decisions taken by firms, both as single units and jointly as expressions of shared visions and objectives within the clusters. Referring to Jonathan Zeitlin's request for a productive dialogue between business history and economic geography on industrial clusters, one contribution of our article is to show how both the single firm unit and a formal cooperative organization are too limited to give an understanding of how clusters have responded to globalization. Recently, some scholars within the economic geography tradition have argued for the need to expand from focusing on endogenous structural phenomena to include firms' behavior and strategy when explaining why some clusters fail and others do not. Belussi and Sedita mention differences in firms' strategies as a reason for multiple path-dependency differences among comparable clusters.<sup>84</sup> Aitziber Elola and colleagues talk about differences in strategic capabilities among firms.<sup>85</sup> We, however, argue that the strategies and behaviors of firms in a cluster should be studied not only at firm level, but also at cluster level. In both clusters we see several examples of key decisions that transcended the firm level. When meeting endogenous challenges, firms in the clusters acted jointly, and these actions were primarily the result of informal dialogues more than decisions in formal organizations.

We can observe a high degree of meta-management when important strategic decisions and actions express the interests and shared thoughts and visions of most actors in a cluster rather than one single firm.<sup>86</sup> We have seen several expressions of meta-management within both industries. When the maritime industry cluster really became involved in the global economy around 2000, the key actors in the cluster all acted in the same way in transforming themselves into firms with a strong international presence. In the furniture industry cluster, however, radical changes occurred. The difference in internationalization strategy around 2000 between the largest furniture producer, Ekornes (which chose to export), and some of the other firms (which chose to move production offshore), shows that the tradition of taking core

decisions informally at cluster level was replaced by corporate-based management in the furniture industry. In our case these differences help explain the different reactions of the two clusters to globalization.

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<sup>1</sup> Poul Houman Andersen, “Regional Clusters in a Global World: Production, Relocation, Innovation, and Industrial Decline,” *California Management Review* 49, no. 1 (2006): 101–22; Aitziber Elola, Mario Davide Parrilli, and Roberta Rabellotti, “The Resilience of Clusters in the Context of Increasing Globalization: The Basque Wind Energy Value Chain,” *European Planning Studies* 21, no. 7 (2013): 989–1006.

<sup>2</sup> Eldar Høidal, *Periferien som ble sentrum: Norsk Treindustriarbeiderforening 100 År* [The history of the Norwegian furniture industry union] (Oslo, 2004).

<sup>3</sup> Håkon With Andersen, “Producing Producers: Shippers, Shipyards and Cooperative Infrastructure of the Norwegian Maritime Complex since 1850,” in *World of Possibilities: Flexibility and Mass Production in Western Industrialisation*, ed. Charles Sabel and Jonathan Zeitlin (Cambridge, 2001), 461–500; Ove Bjarnar, Dag Magne Berge, and Oddbjørn Melle, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 2: Fra fri fisker til regulert spesialist* [The history of the deep-sea fishing fleet in Møre and Romsdal and Trøndelag. vol. 2] (Trondheim, 2006).]

<sup>4</sup> Oddmund Oterhals, Arild Hervik, Øyvind Opdal, and Bjørn G. Bergem, “Utviklingen i maritime næringer i Møre og Romsdal: Status 2008” [The maritime industry in Møre and Romsdal], *Møreforskning Molde Arbeidsrapport M 0802* (Molde, 2008); Oddmund Oterhals and Gøran Johannessen, “Møbelbransjens

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klyngeanalyse: Et delprosjekt under Innovasjon møbel” [The furniture cluster], *Møreforskning Molde Rapport 0902* (Molde, 2009).

<sup>5</sup> For a review, see Jonathan Zeitlin, “Industrial Districts and Regional Clusters,” in *The Oxford Handbook of Business History*, ed. Geoffrey Jones and Jonathan Zeitlin (Oxford, 2008), 219–43.

<sup>6</sup> Francisco J. Medina Albaladejo, “External Competitiveness of Spanish Canned Fruit and Vegetable Businesses during the Second Half of the Twentieth Century,” *Business History* 52, no. 3 (2010): 417–34; Joan Carles Cirer-Costa, “Majorca’s Tourism Cluster: The Creation of an Industrial District, 1919–36,” *Business History* 56, no. 8 (2014): 1243–61; Geoffrey Tweedale, “Backstreet Capitalism: An Analysis of the Family Firm in the Nineteenth-Century Sheffield Cutlery Industry,” *Business History* 55, no. 6 (2013): 875–91; Theresa Gutberlet, “Mechanization and the Spatial Distribution of Industries in the German Empire, 1875 to 1907,” *Economic History Review* 67, no. 2 (2014): 463–91.

<sup>7</sup> Tomoko Hashino and Takafumi Kurosawa, “Beyond Marshallian Agglomeration Economies: The Roles of Trade Associations in Meiji Japan,” *Business History Review* 87, no. 3 (2013): 489–513; Montserrat Llonch-Casanovas, “Trademarks, Product Differentiation and Competitiveness in the Catalan Knitwear Districts during the Twentieth Century,” *Business History* 54, no. 2 (2012): 179–200.

<sup>8</sup> Raphaël Suire and Jérôme Vicente, “Why Do Some Places Succeed When Others Decline? A Social Interaction Model of Cluster Viability,” *Journal of Economic Geography* 9 (2009): 381–404.

<sup>9</sup> Zeitlin, “Industrial Districts,” 232.

<sup>10</sup> *Ibid.*, 221; Andrew Popp and John Wilson, “Life Cycles, Contingency, and Agency: Growth, Development, and Change in English Industrial Districts and Clusters,” *Environment and Planning A* 39 (2007): 2975.

<sup>11</sup> This design is ideal for incorporating the comparative logics analyzed by John Stuart Mill in 1843 and applied in modern historical as well as social science studies, namely the different logics of agreement and difference. These constitute only basic elements of comparison, however, and comparative research needs to account for more complex multivariate explanations of phenomena over time. For our purpose, the two cases embedded within a comparable economic, cultural, social, and institutional framework and within one geographical area will be more suitable than a cross-country comparison. John Stuart Mill, *A System of Logic Ratiocinative and Inductive: Boeving a Connected View of the Principales of Evidence and the Methods of Scientific Investigation* (Honolulu, 2002 [1843]).

<sup>12</sup> Michael Porter, *The Competitive Advantage of Nations* (London, 1990).

<sup>13</sup> Andersen, “Producing Producers,” 461ff.

<sup>14</sup> Joan Crespo, “How Emergence Conditions of Technological Clusters Affect Their Viability? Theoretical Perspectives on Cluster Life Cycles,” *European Planning Studies* 19, no. 12 (2011): 2025–46; Aitziber Elola et al., “Cluster Life Cycles, Path Dependency and Regional Economic Development: Insights from a Meta-Study on Basque Clusters,” *European Planning Studies* 20, no. 2 (2012): 257–79.

<sup>15</sup> Max-Peter Menzel and Dirk Fornahl, “Cluster Life Cycles: Dimensions and Rationales of Cluster Evolution,” *Industrial and Corporate Change* 19, no. 1 (2010): 205–38.

<sup>16</sup> Ron Martin and Peter Sunley, “Conceptualizing Cluster Evolution: Beyond the Life Cycle Model?” *Regional Studies* 45, no. 10 (2011): 1299–1318.

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<sup>17</sup> Gernot Grabher, “The Weakness of Strong Ties: The Lock-in of Regional Development in the Ruhr Area,” in *The Embedded Firm*, ed. Gernot Grabher (London, 1993).

<sup>18</sup> Popp and Wilson, “Life Cycles,” 2989.

<sup>19</sup> Raphaël Suire and Jérôme Vicente, “Clusters for Life or Life Cycles of Clusters: In Search of the Critical Factors of Clusters’ Resilience,” *Entrepreneurship & Regional Development* 26, no. 1/2 (2014): 142–64.

<sup>20</sup> Fiorenza Belussi and Silvia Rita Sedita, “Life Cycle vs. Multiple Path Dependency in Industrial Districts,” *European Planning Studies* 17, no. 4 (2009): 505–28.

<sup>21</sup> Zeitlin, “Industrial Districts,” 232.

<sup>22</sup> Bjarnar, Berge, and Melle, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 2*.

<sup>23</sup> Among all the Norwegian regions, this ownership structure was most prominent in Møre og Romsdal; see Leiv Grønnevet, *Ei vurdering av eigestillhøva i den norske fiskeflåten* [Ownership of the Norwegian fishing fleet] (Bergen, 1966). See also the parliamentary acts, Lov om brigde i mellombels lov av 29, Juni 1956 om eigestillretten til fiske- og fangstfarkostar [Property Rights in the Fishing Fleet Industry Act], Ot.prp.nr. 39 (1967–68), and Lov om regulering av deltakelsen i fisket [Fishery Regulation Act], Ot.prp.nr. 24 (1971–72).

<sup>24</sup> Olav Wicken, “Regional Industrialization and Political Mobilization: Regions in Political Party Systems and Industrialization in Norway,” *Comparative Social Research* 17 (1998): 241–71.

<sup>25</sup> Harald Kjølås, *A.M. Liaaen 150 år: Fra pionerbedrift til ny bydel* [The history of A.M. Liaaen] (Ålesund, 2011); Knut Maaseide, “Bankeskøyta: En snart glemt pionerfartøy i norsk havfiske” [A pioneer in the Norwegian deep-sea fishery history], *Årbok for Sunnmøre Historielag* (2013): 32–72; Henry Vike, *Båt- og skipsbygging i Vestnes* [The history of shipbuilding in Vestnes] (Vestnes, 1994); Harald Grytten, *Creative Enthusiasm for 90 Years 1917–2007* (Ulsteinvik, 2007).

<sup>26</sup> Atle Døssland and Arnljot Løseth, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 1: Mot fjernare farvatn 1860–1960* [The history of the deep-sea fishing fleet in Møre and Romsdal and Trøndelag. vol. 2] (Trondheim, 2006).

<sup>27</sup> In addition to the literature referred to elsewhere, this reconstruction is based on interviews by Ove Bjarnar and Dag Magne Berge from 2004 to 2006 with veterans in the industry: pioneer skippers of factory trawlers and ring net trawlers; pioneer ship owners within the fishing fleet and the offshore supply fleet; equipment producers and sellers; leading industrialists; former government officials; leaders in the fishery organizations and vessel owners association; a banker; and an accounting firm expert advisor for fisheries. The interview material was accessible to the authors until the project *Havfiskeflåten* was closed. The interviews used in this article build on the material as it is presented in Bjarnar, Berge, and Melle, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 2*.

<sup>28</sup> The number of steel vessels in Møre og Romsdal was more than double the number of such ships in the whole of northern Norway: see e.g., Official Statistics of Norway, *Fiskeritellingen* [Fishery Censuses] (1971), 2:tables 1, 11; 4:tables 26, 27.

<sup>29</sup> Høidal, *Periferien som ble sentrum*.

<sup>30</sup> Even Lange, “Småbedrift og moderne teknologi” [Small firms and modern technology], in *Vekst gjennom krise: Studier i norsk teknologihistorie*, ed. Francis Sejersted (Oslo, 1982), 209–30.

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<sup>31</sup> Ove Bjarnar, Arnljot Løseth, and Hallgeir Gammelsæter, “Næringskulturer på Nord-Vestlandet” [Business culture on the west-coast of Norway], in *Nord-Vestlandet—Liv laga?* ed. Hallgeir Gammelsæter, Oddbjørn Bukve, and Arnljot Løseth (Ålesund, 2004), 74–89.

<sup>32</sup> Eldar Høidal, *Ekornes: Fra springfjær til stressless* [The history of Ekornes] (Sykkylven, 2009); Høidal, *Periferien som ble sentrum*.

<sup>33</sup> Overview, 10 Feb. 1962, Box 279, Norwegian Productivity Institute, National Archives, Oslo, Norway, (hereafter NPI).

<sup>34</sup> Kontoret for områdeplanlegging i Møre og Romsdal, *Møre og Romsdal statistisk-økonomisk analyse* [Statistical-economic analysis of Møre and Romsdal] (Molde, 1954), 114, table X.

<sup>35</sup> Vike, *Båt-og skipsbygging*.

<sup>36</sup> Andersen, “Producing Producers.”

<sup>37</sup> Shipbuilding was also far more decentralized to smaller local yards than in any other region. Moreover, during the 1970s, almost one in five producers of equipment (motors, cranes, hydraulics, control systems, etc.) in Norway was located in the region, and one in four producers of fishing gear (lines, trawls, nets, etc.) was operating here. See Bjarnar, Berge, and Melle, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 2*, 320–25.

<sup>38</sup> For example, Sunnmørsbanken, a bank that became a major regional player, was set up in 1975, and the shipbuilding industry association Vestlandske Fartøybyggjarlag expanded from 1945. Bjarnar, Berge, and Melle, *Havfiskeflåten i Møre og Romsdal og Trøndelag Bind 2*, 320–25, 328.

<sup>39</sup> See *Bedriftstelling 1974, Møre og Romsdal. NOS 1976. A776* [Censuses of establishments] (Oslo, 1976), table 4; Per Ove Smogeli, “Skipsbyggingsindustrien I Møre og Romsdal 1970–1980. En geografisk studie av foretaks tilpasning til endringer i de ytre forhold” [The maritime industry in Møre and Romsdal, 1870–1980], *Meddelelser fra Geografisk institutt, Universitetet i Oslo. Ny kulturgeografisk serie Nr. 11* (Oslo, 1983), 73ff., table 5.5.

<sup>40</sup> Summary of a meeting of the NPI branch of Sunnmøre, 26 Mar. 1958; Memomrandum from NPI branch of Sunnmøre, 1 Oct. 1959, Box 271, NPI.

<sup>41</sup> Rolv Petter Amdam and Ove Bjarnar, “Regional Business Networks and the Diffusion of American Management and Organisational Models to Norway, 1945–60,” *Business History* 39, no. 1 (1997): 79–90.

<sup>42</sup> Note from the local branch of Sunnmøre and Ålesund, 1 Oct. 1959, Box 271, NPI.

<sup>43</sup> Lars Hatlehol, *Vinsjemakerne: The Winch Makers* (Brattvåg, 1991); Lars Hatlehol, Johan Roald Pettersen, and Kolbjørn Ringstad, *Fra handkompressor til X-Range: Sperre, 1938–2013—75 år* [The history of Sperre] (Bratvåg, 2013).

<sup>44</sup> This passage is largely based on the interviews as they are documented in note 27 and archival sources. First and foremost the authors have drawn extensively on the archives of the regional newspaper journal *Sunnmørsposten*, which has systematically built up business archives from the post-war period. The archive is organized thematically according to fields like fisheries, marine industry, and maritime industry Consult Bjarnar, Berge, and Melle, *Havfiskeflåten*, for details. The journal *Norsk fiskerinæring*, collected data on a national basis but have no thematically organized archive. As above, *Havfiskeflåten* refers to events by journal number and time of publication. See *Sunnmørspostens* archive, Ålesund, the Gunnerus library in Trondheim, and the library of the Norwegian Technical University (NTH, later NTNU).



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<sup>45</sup> Høidal, *Ekornes*; Høidal, *Periferien som ble sentrum*; Eldar Høidal and Anders Hæggström, *In Movement: The 75th Anniversary of Stokke As* (Sykkylven, 2009).

<sup>46</sup> Julian Birkinshaw, "Upgrading of Industry Clusters and Foreign Investment," *International Studies of Management & Organizations* 30, no. 2 (2000): 93–113.

<sup>47</sup> As early as the mid-1940s, some entrepreneurial firms in the region pioneered technological developments in fish detecting in cooperation with Forsvarets Forskningsinstitutt, the defense industry's research institute, and also with Havforskningsinstituttet, a national marine research organization. During the 1960s and 1970s a comprehensive development of nets and trawls was undertaken by several local firms, the technical university in Trondheim, Norges Tekniske Høgskole, The University of Bergen, and the Norwegian School of Business, also in Bergen. Consult Bjarnar, Berge and Melle, *Havfiskeflåten*, 90–95, 129, 339–55.

<sup>48</sup> Andersen, "Producing Producers."

<sup>49</sup> Marco Bellandi and Annalisa Caloffi, "District Internationalisation and Trans-Local Development," *Entrepreneurship & Regional Development* 20, no. 6 (2008): 517–32.

<sup>50</sup> Harald Grytten, Ørnulf Opdahl, and Per Eide, *Maskiners arbeid og henders verk: Ulstein 1917–1992* [The history of Ulstein, 1917–1992] (Ulstein, 1992).

<sup>51</sup> Hatlehol, *Vinsjemakerne*.

<sup>52</sup> Bjarnar, Berge, and Melle, *Havfiskeflåten*, 328f.

<sup>53</sup> See Official Statistics of Norway, *Industristatistikk* [Industrial statistics] (several editions, Oslo, 1970–1985) for the larger pattern.

<sup>54</sup> This is based on an interview with Odd Kjell Sjøvik, 5 May 2001; and a memorandum to the authors from Sjøvik dated 22 June 2006.

<sup>55</sup> Bjarnar, Berge, and Melle, *Havfiskeflåten*, 328.

<sup>56</sup> This reconstruction also builds on the organizational archives of the shipowner organizations Fiskebåtrederens Forbund and Aalesunds Rederiforening, both in Ålesund.

<sup>57</sup> Ove Bjarnar, "Transformation of Knowledge Flow in Globalizing Regional Clusters," *Møreforskning Molde Working Paper 2010* (Molde, 2010), 2. Interviews with Inge Huse at I. P. Huse, Harøya, May 2008 and May 2014.

<sup>58</sup> This pattern is reflected in the archives of a central company in the cluster, Ulstein Group. See for example a series of internal and public newspapers in Ulstein's archives, *Ulsteinvik*: Boxes *Ulsteinposten*, following issues: Spring 1984, Fall 1984, Fall 1988, Nov. 1988, Dec. 1988, Boxes *Ulstein Internt*: following issues: Feb. 1986, Nov. 1997, Boxes *Ulstein info*, following issues: 9 Nov. 1993, 6 May 1994, 8 Nov. 1994, 29 Mar. 1995, 6 Apr. 1995, 6 Aug. 2004. The archival research was developed by Lise L. Halse assisted by Ove Bjarnar, and the results published. Lise L. Halse and Ove Bjarnar, "The Evolution of the Maritime Cluster in North West Norway," Paper 1 in Lise L. Halse, "Walking the Path of Change: Globalization of the Maritime Cluster in North West Norway" (PhD diss. in Logistics, Molde University College, 2014), 3.

<sup>59</sup> Oterhals et al., "Utviklingen i maritime næringer i Møre og Romsdal."

<sup>60</sup> *Ibid.*

<sup>61</sup> Norwegian Shipowners' Association, *Norske offshore redier: Skaper verdier lokalt, vinner globalt* [The Norwegian offshore vessel industry] (Oslo, 2013).

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<sup>62</sup> Based on information from the webpages of 63 member companies of the Norwegian Business Association in Shanghai. The member list was downloaded from [www.nbash.com](http://www.nbash.com) on 2 Dec. 2011, and the information was collected from firms' webpages between 2 to 19 Dec. 2011.

<sup>63</sup> Interview Ove Bjarnar with Inge Huse, CEO of IP Huse 22 Apr. 2008.

<sup>64</sup> Interview by Ove Bjarnar with Per Olaf Brett, a member of Ulstein's top management team, 15 Apr. 2012.

<sup>65</sup> Halse and Bjarnar, "The Evolution of the Maritime Cluster."

<sup>66</sup> Official Statistics of Norway, *Historical Statistics 1974* (Oslo, 1978).

<sup>67</sup> "Industriens stilling under en nordisk tollunion" [The industry and the Nordic customs union], Memorandum Oct. 1957, Box 177, "Industriens stilling under europeisk frihandelsområde" [The industry and the European free trade agreement], Memorandum 17 Dec. 1957, Box 175, both Industry Section, Ministry of Industries, National Archives, Oslo, Norway.

<sup>68</sup> Høidal, *Ekornes*, 172.

<sup>69</sup> Høidal and Häggström, *In Movement*.

<sup>70</sup> Official Statistics of Norway, *Historical Statistics*. 1 US\$ = 7 NOK in this period.

<sup>71</sup> Peder Myrstad, *En struktur og perspektivvurdering av møbelindustrien på Sunnmøre* [The structure of the furniture industry in Sunnmøre] (Ålesund, 1977).

<sup>72</sup> The following part is based on an interview by Ove Bjarnar with Peder Myrstad in May 1991, and documents from his private archive.

<sup>73</sup> Ove Bjarnar, "Et regionperspektiv på innovasjonspolitikken" [A regional perspective on the innovation policy], in *Innovasjonspolitik, kunnskapsflyt og regional utvikling*, ed. Hallgeir Gammelsæter (Trondheim, 2000), 123–43.

<sup>74</sup> Official Statistics of Norway, *Historical Statistics 1994* (Oslo, 1995).

<sup>75</sup> Rolv Petter Amdam, Randi Lunnan, and Gediminas Ramanauskas, "FDI and the Transformation from Industry to Service Society in Emerging Economies: A Lithuanian–Nordic Perspective," *Engineering Economics* 51, no. 1 (2007): 22–28.

<sup>76</sup> Per Arne Solen, "Norsk industry flagger ut," *Dagbladet, Part 2*, 18 Jan. 2003, 12.

<sup>77</sup> Teknologibedriftenes Landsforening – Møbel Industri, *Årsrapport 2003* [Annual report] (Oslo, 2003).

<sup>78</sup> Høidal, *Ekornes*.

<sup>79</sup> Andersen, "Producing Producers."

<sup>80</sup> Grabher, "The Weakness of Strong Ties."

<sup>81</sup> Amdam and Bjarnar, "Regional Business Networks."

<sup>82</sup> Andersen, "Producing Producers."

<sup>83</sup> Blue Maritime Cluster, *Braking Waves, Operation Report 2014*, (Ålesund, 2014).

<sup>84</sup> Belussi and Sedita, "Life Cycle vs. Multiple Path Dependency."

<sup>85</sup> Elola, Parrilli, and Rabellotti, "The Resilience of Clusters."

<sup>86</sup> Bellandi and Caloffi, "District Internationalisation."