Mitteilungen der Österreichischen Geographischen Gesellschaft, 166. Jg., S. 121–144
(Annals of the Austrian Geographical Society, Vol. 166, pp. 121–144)
Wien (Vienna) 2024, https://doi.org/10.1553/moegg166-082

How the Danish Furniture Industry Gains a Competitive Advantage through Location Strategy – A National and Regional Cluster Analysis

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Initial submission / erste Einreichung: 01/2023; revised submission / revidierte Fassung: 04/2024; final acceptance / endgültige Annahme: 09/2024

with 1 figure and 3 tables in the text

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Summary

This paper analyses the competitive advantages brought by location strategy in the furniture industry in Denmark. The competitive advantages achieved through location have been one of the main interests in the geographic economics research field. The aim of this study is to analyse the competitive strategy of agglomeration and clusters in Denmark through qualitative research using questionnaires and interviews. The result shows that the entire Danish furniture industry can be depicted as a national cluster based on

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Porter's three cluster dimensions and value chain theory, which leads the industry to become more efficient. This analysis also confirms the existence of regional clusters and their constant innovation. There are different opinions about their existence: this analysis determines that they have neither moved to the big cities – Copenhagen and Aarhus – nor disappeared. They are still in West Jutland. The regional cluster in Skive, West Jutland can be taken as an industrial district or cluster. The competitiveness of the regional clusters is not decreasing but improving. The national and regional clusters have advantages and disadvantages that contribute to the competitiveness of the furniture industry in different ways. Finally, this article gives suggestions for policymakers, such as establishing industrial parks. In general, this will contribute to research in the field of agglomeration and cluster.

Keywords: Location, furniture, agglomeration, national cluster, regional cluster, industrial district, Denmark, West Jutland

Zusammenfassung

Wie die dänische Möbelindustrie durch eine Standortstrategie einen Wettbewerbsvorteil erlangt – eine nationale und regionale Analyse von Clustern

In diesem Beitrag werden die Wettbewerbsvorteile analysiert, die sich aus der Standortstrategie der dänischen Möbelindustrie ergeben. Standortfragen und die durch den (optimalen) Standort erzielten Wettbewerbsvorteile sind eine der Hauptinteressen im Bereich der wirtschaftsgeographischen Forschung. Ziel dieser Studie ist es, die Wettbewerbsstrategie von Agglomerationen und Clustern in Dänemark durch qualitative Forschung mittels Fragebögen und Interviews zu analysieren. Das Ergebnis zeigt, dass die gesamte dänische Möbelindustrie auf der Grundlage der drei Clusterdimensionen von Porter und der Theorie der Wertschöpfungsketten („value chain theory") als nationaler Cluster dargestellt werden kann, was zu einer höheren Effizienz der Industrie führt. Die vorliegende Analyse bestätigt auch die Existenz von regionalen Clustern und deren ständige Innovation. Zu diesem Thema gibt es unterschiedliche Auffassungen: In dieser Analyse wird festgestellt, dass die dänische Möbelindustrie weder in die großen Städte – Kopenhagen und Aarhus – abgewandert noch verschwunden ist. Sie befindet sich immer noch in Westjütland. Der regionale Cluster in Skive, Westjütland, kann als stabiler Industriedistrikt oder -cluster betrachtet werden. Die Wettbewerbsfähigkeit der regionalen Cluster nimmt nicht ab, sondern zu. Die nationalen und regionalen Cluster haben Vor- und Nachteile, die auf unterschiedliche Weise zur Wettbewerbsfähigkeit der Möbelindustrie beitragen. Schließlich enthält dieser Artikel Vorschläge für politische Entscheidungsträger, wie beispielsweise die Einrichtung von Industrieparks. Generell wird damit ein Beitrag zur Forschung auf dem Gebiet der Agglomeration und der Cluster geleistet.

Schlagwörter: Lokalisierung, Standortvorteile, Möbelindustrie, Agglomeration, nationale Cluster, regionale Cluster, Dänemark, Westjütland

1 Introduction

The strategic implications of the information-based, knowledge-driven, service-intensive economy require speed, flexibility, and continuous self-renewal in industries. Similar requirements apply to the low-tech production furniture industry in Denmark in the international market, as more than 90 percent of the total revenue comes from exports. Denmark is a country with high production and labour costs. Consequently, the highly vigorous competition of Denmark's wood and furniture industry at the international level has to be explained by its strategy, in which design, flexibility and self-renewal might play an important role in the competitive strategy. In addition, the minimisation of cost based on the location strategy of furniture producers has to make it possible to compete with products from other countries (Maskell 1996), and this is used in Denmark to maintain and improve quality while achieving cost efficiency.

Traditionally, location has been especially important to the furniture industry globally, where most companies are small- and medium-sized enterprises (SMEs) with limited access to capital and labour. The strategy of SMEs is to form clusters to cooperate in order to survive and overcome difficulties in building long-distance production networks (Renda et al. 2014; Scott 2006; Hedemann and Nissen 2013). Therefore, to overcome serious competition from foreign furniture producers, local Danish producers agglomerate (Lorenzen 1999; Scott 2006). These agglomerations are becoming the main driver of furniture export in Denmark.

Therefore, this research analyses from an economic geographic perspective how the Danish furniture industry gains competitive advantages from agglomeration in national and regional clusters.

This analysis provides four contributions. The first contribution is that the research fills a gap in this scientific field. This is the only research about the Danish furniture industry and clusters in the last ten years. Interviews with Danish professors from the field of economic geography revealed that they do not know anyone who is doing research on this topic now. According to the secondary research, the most recent relevant literature is by Howells and Hedemann (2008) and Hedemann and Nissen (2013), both dating from more than ten years ago. The research critiques these two articles.

The study's second contribution is to assert that the whole Danish furniture industry acts as a cluster and can consequently gain competitive advantages. No previous research has considered the entire industry in the country as a cluster and has only investigated clusters located in different regions in the country (Santisteban 2006; Robertson and Jacobson 2011; Molina-Morales 2008; Maskell et al. 1998; Howells and Hedemann 2008; Hedemann and Nissen 2013; Lorenzen 1999). In terms of the literature, a description of one industry in the country as a cluster is a new point of view.

The third contribution is that the study confirms the existence and competitiveness of furniture clusters in West Jutland. There are different opinions about the existence of the furniture clusters in the region: Ms. C in 'Lifestyle and Design Cluster Denmark' thinks that the cluster in Skive, West Jutland has already disappeared. She does not think there are many producers there; thus, it is not necessary for this organisation to promote

Skive, and consequently they only promote the furniture producers in Copenhagen and the cluster in Herning, West Jutland. Hedemann and Nissen (2013) think that the location has changed from small towns to big cities, whereas Professor A in Copenhagen business school believes that the cluster still exists in the old place. This research discusses these opinions and determines which is confirmed by the analysis. In addition, whether the cluster in West Jutland is declining or growing is also discussed.

The fourth contribution further distinguishes the difference between the nature of the national cluster and the regional cluster in Skive and the Salling Peninsula.

This article is structured as follows. The next section reviews the literature concerning the definitions and externalities of agglomeration, the concept of the cluster and different opinions on it, the differences and relationships between industrial districts and clusters, three main types of cluster externalities and the differences among them, and the industrial cluster policies. The third section introduces the data and methodology. It explains the sample selection and data collection for the qualitative semi-structured, in-depth interviews and questionnaires. The fourth section describes the background of the Danish furniture industry. Following this is the analysis section: The first part depicts the whole industry as a national cluster and analyses how the industry gains competitive advantages from it; the second part investigates the location of the regional clusters and their competitiveness; and the third part points out the advantages and disadvantages of the national and regional clusters. Finally, the results are summarised and evaluated in the conclusion and policy suggestions are made for the Danish furniture clusters.

2 Theoretical Background

2.1 Externalities of Agglomeration

Industrial agglomeration refers to firms in the same industry located in the same geographic area (Rocha and Sternberg 2005). Palacios (2005) defined an agglomeration as the concentration of businesses and industrial plants in a specific region or location. The regional similarity of their location results in so-called industrial externalities (Rocha and Sternberg 2005). There are different points of view about these externalities. Porter (1990) mentions that industrial agglomeration could lower prices, material costs, uncertainty of business management, and entrance and exit costs. Malmberg et al. (2000) and Maskell (1996) argue that the main externality is the reduction of transportation and transaction costs by cooperating with suppliers and customers located in the agglomeration. Rocha and Sternberg (2005) quote Storper (1997), stating that the main externality is saving transaction costs: Agglomeration results in production complexes and flexibility, which lowers the transaction costs for each firm. Palacios (2005) states that firms or institutions in the region make use of a common resource pool. They utilise specialised facilities and infrastructure together. Glaeser (2010) thinks the externality all ultimately comes from transport costs savings since it is easier to connect with a neighbour. Of course, transportation costs must be interpreted broadly, and they include difficulties

in exchanging goods, people, and ideas. Qian (2014) thinks the externalities are lower transportation costs, economies of scale and shared labour, industry specific inputs, and to a lesser extent, knowledge spillover.

2.2 Different Concepts and Definitions of 'Cluster'

Clusters go beyond the agglomeration of firms to include the tight interaction networks that bind certain firms and industries in the area together in various aspects of common behaviour such as sources of innovation, shared suppliers and factors of production (Rocha and Sternberg 2005; Bergman and Feser 1999).

The concept of the cluster was primarily posed by Porter (1990; cf. Ortega-Colomer et al. 2016), who claimed that a cluster is a geographic concentration of interconnected businesses, suppliers and associated institutions in a particular field. Clusters are considered to increase productivity so that companies can compete nationally and globally (Porter 1990).

The definition of a cluster builds on three key dimensions. Firstly, clusters have a geographic dimension. They arise due to externalities that depend on proximity. Clusters are therefore often concentrated in particular regions within larger nations, and sometimes in a single town. Secondly, clusters have an activity dimension. They encompass activities involving companies in different industries that are interconnected in the provision of goods and services valued by customers. Thirdly, clusters have a business environment dimension. They are affected by cluster-specific conditions that are often the result of actions taken by companies, government agencies, universities, other public institutions, and the private sector acting individually and collectively (Porter and Ketels 2009).

The geographic scope of a cluster can be a single city or state, or a country, or even a network of neighbouring countries (Porter 1998). The term 'cluster' is also known as an industry cluster, competitive cluster or 'Porterian cluster' (Porter 1990). Porter's main objective was to identify the nature of firms' competitiveness which resulted in the development of the cluster framework. He developed the value chain model to identify sources of competitive advantage at firm level (Porter 1980) and then proposed the well-known diamond model (Porter 1990), which was followed in Porter (1998) by the cluster framework.

The concept of the value chain describes the full range of activities that are required to bring a product or service from conception and through the different phases of production, distribution to consumers, and final disposal after use. As the product moves from one player in the chain to another, it is assumed to gain value. The diamond model describes a nation's competitive advantage in the international market. In this model, four attributes are taken into consideration: factor conditions, demand conditions, related and supporting industries, and firms' strategy, structure and rivalry (Porter 1980; 1990; Dubey et al. 2020).

In spite of the increasing popularity of the cluster concept in academia and politics (e. g. Ketels 2003), it has encountered serious criticism that it is chaotic, vague and definitionally elusive (Gordon and McCann 2000; Martin and Sunley 2003). In order to differentiate among clusters, more variables were included in the analysis which has

resulted in the concept of the cluster being adapted to enable application to any sector or region (Ortega-Colomer et al. 2016).

Porter's cluster theory has also been criticised. They said his cluster concept focused on the economic space without the physical sphere and lacked on specifics (Malmberg and Maskell 2002; Asheim and Coenen 2005; Williams et al. 2016; Bergman and Feser 1999).

However, Perroux (1950) viewed the economic space as the non-spatial sphere in which relationships between firms and their buyers and suppliers (as well as other key economic institutions) take place. For Perroux, there is no reason why the physical space should necessarily bear any relationship to economic space; enterprise linkages will extend without spatial limit throughout the globe, at least where they are economically justified. Directing one's analysis to particular regions will only provide a distorted picture of the growth and development process. Trullén (2009) sees the cluster as a fairly good choice, on the basis that the ambiguity of the concept of the cluster has some benefit because it embraces different interpretations.

2.3 Differences and Relationship between Industrial Districts and Clusters

Unlike clusters, industrial districts include an analysis of the social embeddedness into what the literature calls 'locality' (Porter and Ketels 2009). Marshall is the father of the modern concept of industrial district, having discovered their existence (Belussi and Caldari 2009). His belief is that localised industry is an industry concentrated in certain localities (Marshall 1920, reprinted in Belussi and Caldari 2009). This approach re-emerged in the 1970s when some researchers argued that the innovative capacity of some small- and medium-sized enterprises (SMEs) in Italy could overcome the decline of the Fordist production model (Becattini 2002). A vast number of case studies on Italy became the starting point for a new paradigm, the most important research among them being that by Becattini (1990); Porter and Ketels (2009); Ortega-Colomer et al. (2016). Becattini (1990; 2017) defines an industrial district as a socio-territorial entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge.

There are two main characteristics of the industrial district. Firstly, a special atmosphere captures the flows of intangible resources and knowledge circulating within a district, which gives various advantages to the firms gathered together in a particular area. The second characteristic is a peculiar combination of competition and cooperation. In districts, firms specialise in particular phases of the productive process: the different phases are not isolated. The district comes to be not only competitive owing to the presence of many firms, but also cooperative, where different firms interact in an exchange process (Becattini 2017; Belussi and Caldari 2009; Ortega-Colomer et al. 2016).

There are mainly three differences between the industrial district and the cluster. Firstly, they focus on different types of company. The clear focus of the industrial district is on agglomerations of small- and medium-sized enterprises (SMEs) operating in a specific

range of light manufacturing industries. SMEs, especially when collected in a district, can compete with large firms due to the presence of external economies. However, there are configurations of clusters in which a few large companies coexist with SMEs, where cluster participants are large firms, and many others (Belussi and Caldari 2009).

Secondly, they define the competition in different ways. The competition in the industrial district is industrial competition. The very meaning of industrial competition is the attempt to obtain a monopoly. Cooperation has brought industrial competition under constantly greater control. Nonetheless, cluster theory grew out of a broader framework for understanding the influence of locations on the competitiveness of individual companies (Belussi and Caldari 2009; Porter and Ketels 2009).

Thirdly, they view the regional economy from different angles. An industrial district refers explicitly to a community of people and the context in which knowledge flows and numerous diverse categories of relationships occur. A cluster barely refers to the social aspects of clustering since it is the individual firm that is the focus of the analysis. Social issues are seen to be the result of the economic success of private firms, while the success of economic issues for an industrial district is the result of the social cohesion within a community of people (Ortega-Colomer et al. 2016).

In general, clusters encompass the configuration found in industrial districts, so that industrial districts are one type of cluster. However, the form of cluster described by the traditional industrial district literature has faced specific challenges in sustaining competitive advantage. Globalisation has led to the restructuring of many clusters and shifted the relative positions of clusters in different locations. What is emerging is a mixed model in which a traditional industrial district relocates some activities to lower wage locations, sometimes establishing sister clusters in the process. However, cluster literature can surely benefit from deeper insights into cultural and institutional factors that grow out of the industrial district tradition. The industrial district literature can also benefit from the more general analytical framework of clusters. The key is to make the two research traditions complementary rather than competing (Porter and Ketels 2009).

2.4 Three Main Types of Cluster Externalities and the Differences Among Them

There are three representative types of cluster externalities. The first is *'Marshallian externalities'*. Marshall thinks there are mainly three externalities produced in the industrial district: access to the skilled labour force pool, easy access to specialised suppliers, and knowledge spillovers. These externalities attract more firms to enter the district (Marshall 1920; Bell 2005; Folta et al. 2006; cf. Giuliani 2005). Marshallian's (1890) externalities are rediscovered as externalities of input, labour market and knowledge by Arrow (1962) and Romer (1986) (cf. Beaudry and Schiffauerova 2009; Mayer et al. 2008). Indeed, Glaeser et al. (1992) refer it to 'MAR externalities'. Therefore, these externalities became known as the 'Marshall-Arrow-Romer (MAR) model'. This model claims that the concentration of an industry in a region promotes knowledge spillovers between firms and facilitates innovation in that particular industry within that region. This

specialisation encourages the transmission and exchange of knowledge, of ideas and information, whether tacit or codified; of products and processes through imitation; business interactions; and inter-firm circulation of skilled workers without monetary transactions. Glaeser et al. (1992) further argue that a local monopoly is better for growth than local competition, because a local monopoly restricts the flow of ideas to others and so allows externalities to be internalised by the innovator, which protects ideas and allows the rents from innovation to be appropriated. Such interactions can thus positively influence firms' productivity and growth. These intra-industry spillovers are known as localisation (specialisation) externalities.

The second type of cluster externalities is *'Jacobian externalities'*. Jacobs (1969, cf. Beaudry and Schiffauerova 2009) and Rosenthal and Strange (2020) argue that the most important sources of knowledge spillovers are external to the industry within which the firm operates. Since the diversity of these knowledge sources is greatest in cities, she also claims that cities are the source of innovation. Her theory emphasises that the variety of industries within a geographic region promotes knowledge externalities and, ultimately, innovative activity and economic growth. Jacobs sees diversity rather than specialisation as a mechanism leading to economic growth. Therefore, a diversified local production structure gives rise to urbanisation (diversification) externalities. A further argument in her thesis concerns competition, which is desirable for the growth of cities and firms as it serves as a strong incentive for firms to innovate and hence speeds up technology adoption.

The third type of cluster externalities is *'Porter externalities'*. Porter's (1990) argument, like Jacobs', is that competition is better for growth. Strong competition in the same market provides significant incentives to innovate, which in turn accelerates the rate of technical progress and hence of productivity growth. However, Porter also argues that knowledge spillovers occur mainly within a vertically integrated industry, thus agreeing with the Marshallian specialisation hypothesis in identifying intra-industry spillovers as the main source of knowledge externality (Beaudry and Schiffauerova 2009; Rosenthal and Strange 2020).

In general, MAR, Jacobs and Porter agree that there are geographical effects of the agglomeration of firms, but that is as far as it goes. There are two differences among the thinking of the three. Firstly, they disagree on the effect of industry concentration and diversity: MAR and Porter specifically argue that knowledge spillovers flow better within a specific industry, while Jacobs argues that knowledge spills over across diversified industries. Secondly, they differ in the effect that local competition has on knowledge spillovers and growth: Jacobs and Porter favour local competition rather than a monopoly as conducive to growth, while MAR would argue that such an environment is not helpful to innovation as the risk of ideas leaking to others is too high (Beaudry and Schiffauerova 2009; Rosenthal and Strange 2020).

2.5 Industry Policies for Clusters

There are many policies addressing the cluster. In Europe, there are two types of government intervention. Vertical policies are interventions that are applied differentially across

sectors of the economy and essentially target the economic output of specific industries (and even firms). Horizontal policies are interventions applied across the board that aim to achieve economic objectives that affect all sectors. In less advanced economies, the main aim is to choose and establish a particular path for catching up, and so the choice of vertical policies is in some sense easier. In contrast, in advanced economies, future development patterns with regard to new industrial activities, new products and new technologies are unknown, and so industrial policy has a more horizontal approach and is based on comparative advantages (building a stock of skills, infrastructure and public inclination to support technologies or selected activities). In 2002, the European Commission defined its industrial policy as horizontal in nature, but with a need to take into account the specific needs and characteristics of individual sectors. It therefore needs to be applied differently according to the sector. Industrial policy therefore inevitably brings together a horizontal basis and sectoral applications (Szczepanski and Zachariadis 2019; D'Alfonso et al. 2018).

Cohen (2006) thinks that the contrast between horizontal and vertical industrial policies conceals the vertical effects of horizontal policies: people need to understand that the broadest horizontal policies have clear sectoral effects. Mowery and Nelson (1999) in Cohen (2006) propose horizontal policies tailored to a specific industrial sub-system: Therefore, instead of improving competitiveness company by company and running the risk of distorting competition, a cluster-based use of economic policy instruments which can benefit multiple companies simultaneously can be more efficient and more effective.

Mowery and Nelson (1999) suggest a number of lessons for industrial policy which essentially involve the synthesis of vertical and horizontal industrial policies or a pooling of policies, namely monetary and fiscal policies stimulating investment, competition policies encouraging structural dynamism, aid policies avoiding supporting failing companies, and education policies favouring applied learning based closely on corporate research principles.

There are different opinions on whether or not the government intervention is useful. According to Cohen (2006), some deny that the state has any competence while some seek to clarify the specific conditions for appropriate intervention. Cohen confirms the role played by government, using successful examples like the US federal state in the formation of clusters in new information and communication technology; the Chinese government in providing incentives for technology transfer by regulating foreign direct investment; and the Finnish government in promoting mobile communication technologies. Uyarra and Ramlogan (2012) contend that policymakers therefore need to strike a careful balance between a hands-off approach and direct steering: They suggest that pushing the system gently towards favoured structures that can grow and emerge naturally is a good idea.

3 The Furniture Industry in Denmark

Denmark is a country with high production and labour costs. Furniture producers have to make their costs as low as possible to compete with products from other countries (c.f. Maskell 1996). Location strategy is used in Denmark to maintain or improve quality

while trying to achieve cost efficiency. In the furniture industry in Denmark, more than 90 percent of the total revenue has been coming from exports. The furniture export intensity (the percentage of production accounted for by exports) since 1990 has permanently been above 70 percent.

Furniture production from West Jutland in Denmark is the main driver of exports (ITTO and ITC 2004; Hedemann and Nissen 2013; Renda et al. 2014). For example, in the two counties of West Jutland – Ringkøbing (a county in the local authorities of Herning and Ikast) and Viborg (subregion of the Salling Peninsula), manufacturing exports increased substantially. They grew from 42.8 percent in 1980 to 68.5 percent in 1995 in Ringkøbing, with similar results for Viborg.

In the period 1980–1995, total growth in manufacturing exports by volume was 125.2 percent for Ringkøbing, while it was 74.3 percent for Denmark; thus it is much higher than that of the whole country. The wood and furniture industry is one of the three most important manufacturing sectors in the counties (the other two are food and beverages along with textiles and clothing). In 1994, these three sectors represented 64 percent of manufacturing GVA (gross value added) in Ringkøbing, 51 percent in Viborg, and 37 percent at the national level (Jensen-Butler et al. 2003; Engelstoft et al. 2006).

4 Data and Methodology

For the qualitative research of this study, both primary and secondary data were collected to analyse the furniture industry and companies in Denmark.

Primary data derived from the interviews and questionnaires were conducted with five companies in Denmark (Republic of Fritz Hansen, Reform, Magnus Olesen, Brdr. Peterson and Skoby) (Table 1), four institutions in Denmark (Cluster Excellence Denmark, Lifestyle and Design Cluster Denmark, Association of Danish Wood and Furniture Industries, United Federation of Danish Workers), two professors from Copenhagen Business School and two professors from Copenhagen University. The interviews and questionnaires were completed by CEO, co-founder, director, supply chain manager, store manager, senior consultant, consultant and professors.

Secondary data were drawn from the academic articles such as Hedemann and Nissen (2013); Lorenzen (1999); Maskell (1996), Homepage of BoConcept and European cluster collaboration platform.

Qualitative research methods – semi-structured in-depth interviews and questionnaires – were used for requiring information from companies. The selection of the sample companies is according to the current situation and structure of the Danish furniture industry. Denmark is one of the world's leading furniture producers with a strong reputation for quality and style. The industry has achieved success in high end products (CBI Market Information Database 2006). Therefore the Republic of Fritz Hansen, with the largest sales in Copenhagen; another high end producer, Skovby, from Aarhus; and Magnus Olesen, as the largest company in the regional cluster, were chosen (Mr. S in Republic of Fritz Hansen, personal communication, November 5, 2017; Professor A in Copenhagen Business School, personal communication, August 25, 2017). Meanwhile, the Danish furniture

Name	Location	Starting Year	Products	Design style
Republic of Fritz Hansen	Copenhagen	1872	table, chair, sofa, shelving, lighting, accessories and spare parts	classic and contemporary
Reform	Copenhagen	2014	kitchen furniture	classic design of Ikea
Magnus Olesen	Skive	1937	furniture for public spaces, hotel, restaurant and care market	functional, aesthetic and unique
Brdr. Peterson	Copenhagen	1973	chair and sofa	classic
Skovby	Aarhus and Silkeborg	1933	dining room furniture	aesthetic expression with innovative function

Source: Homepages of Republic of Fritz Hansen, Reform, Magnus Olesen, Brdr. Peterson, and Skovby[1)]

Table 1: General introduction about the Danish firms analysed in this study

industry is characterised by very small producers and many firms function as subcontractors (Maskell 1996; Hedemann and Nissen 2013). Therefore, the small company Reform and a half subcontractor, half producer Brdr. Peterson were selected.1)

Twenty-three interview questions were designed for the companies to cover three elements: internal and external factors, and location decisions related to the four important factors (agglomeration, cluster, linkage and production subcontract) for the furniture industry. Thirteen questions were about the internal situation, such as the development history, the input of the companies and location factors. Seven questions were about the external situation, such as the political and demand situation. The remaining questions addressed how the four important factors affect the company's location.

Two types of questionnaire were sent to the companies, one with seven questions and one with fifteen questions. The questionnaire to use depended on how many questions the companies were willing to answer. The questions were selected from the interview questions, which are about the internal and external situation and the location decisions of the company.

The interviews and the questionnaire also were taken to two institutions: Cluster Excellence Denmark, and Lifestyle and Design Cluster Denmark. These are the only two institutions related to the furniture cluster in Denmark. Therefore, it is significant to acquire relevant information about the current cluster situation from them. The interview and questionnaire taken to the Association of Danish Wood and Furniture Industries and United Federation of Danish Workers sought to discover the current situation in the furniture industry in relation to, for example, human resources and location. Two professors from Copenhagen Business School and two professors from Copenhagen University from

1) For more details see: *https://fritzhansen.com, https://www.reformcph.com/da*, *https://magnusolesen.dk*, *https://objects.nyc/brdr-petersen-1*, *https://www.skovby.com*.

the field of economic geography were also interviewed, the purpose being to acquire information related to the research area, such as the location and competitiveness situation of the furniture industry.

The interviews were recorded. The content of the interviews and questionnaires was interpreted and rephrased according to the case studies' needs.

5 Analysis of the National Cluster and Definition of Type

Generally speaking, the whole of Denmark can be called a cluster according to Porter's cluster theory. Porter and Ketels (2009) mentioned that a cluster has three dimensions – geographic, activity and business environment. The Danish furniture industry has the three dimensions which can be described as follows.

Firstly, it has gained externalities through geographic dimensions both locally and internationally. Locally, it cooperates in production, promotion and sales. Production is mainly outside Copenhagen and Aarhus. Design and promotion are concentrated in Copenhagen and Aarhus. There are three phenomena that can reflect the cooperation. Firstly, all the large companies, like Fritz Hansen, Magnus Olesen and Skovby, have showrooms in Copenhagen and Aarhus. Secondly, some only act as design and sales companies in Copenhagen, outsourcing all their production to other parts of Denmark. For example, Reform outsourced all its production to Jutland in Denmark. The company is only responsible for design and sales in Copenhagen. There are many similar companies in Copenhagen such as Muuto, Gubi and Hay, who have outsourced all their production. Thirdly, there are small producers producing outside Copenhagen. For example, Brdr. Petersen, the half producer, half subcontractor located in the rural area of Copenhagen, is outsourcing non-wooden parts for Danish companies and outsourcing wooden parts to the other producers nearby.

Meanwhile, the Danish furniture industry consolidated the transportation. All the producers consolidate transportation through one logistics company (LGT). The producers can reduce costs this way. Logistics company LGT in Horsens in Jutland transports the furniture for many big producers in Denmark such as Carl Hansen, Frit Hansen, Fredericia and Muuto, delivering it to the Danish retailer – Illum Bolighus – to sell. There is a harbour from which the product is shipped to the customer.

Internationally, the furniture industry has reduced costs through a global production network. Some companies have invested in production overseas through outsourcing and offshore production[2)] in Eastern Europe and Asia. In the latter part of the 1990s, the outsourcing of production to East Europe boomed. Based on national statistics, the importance of foreign production intensified in the late 1990s. In the early 2000s, this tendency started growing at a rapid pace. The countries explored in this process were primarily Poland, followed by Estonia, Lithuania and Latvia as sourcing markets, the reason behind

[2)] Offshoring is a popular strategic practice, whereby firms disaggregate fine pieces of activities from their value chains and relocate (or "offshore") them across national borders in the pursuit of cost savings, higher performance or learning opportunities (Mykhaylenko et al. 2015).

this development being that the Danish furniture industry was characterised by very small producers. They did not have the financial power or the necessary international knowledge to establish their own operation sites in Poland or the Baltic states. A few Danish furniture companies established their own operation sites in Poland or the Baltic States in the latter part of the 1990s (Hedemann and Nissen 2013).

For example, Fritz Hansen started to produce furniture more than 100 years ago, and at that time it produced all the furniture at the headquarters. At the beginning of 2000, the situation changed: they only produce the plastic shell of a chair designed by Arne Jacobsen at the headquarters (the base of the chair is outsourced to Poland). Upholstery products and wooden chairs are produced in the factory in Poland. Around 50 percent of Fritz Hansen's outsourcing is to Poland, 20 percent to Denmark, 10 percent to Latvia, and 20 percent to other overseas markets such as China. Magnus Olesen in Jutland produce the main part in the headquarter, outsource some unimportant parts to other producers in Denmark, less developed countries in Eastern Europe (Baltic countries and Poland) and China.

Secondly, the Danish furniture industry has improved their competitive advantages through activity dimensions. The Danish companies are interconnected with local companies in related industries. For example, for Fritz Hansen, one of its leather suppliers, Sorensen Laeder, is from Denmark, and they have already cooperated for over ten years. Similarly, a customer, Radisson Blu Royal Hotel in Denmark, has worked with Fritz Hansen for almost 60 years: its furniture has all been designed by Arne Jacobsen (1902–1971) (the designer of Fritz Hansen) since 1958. In room 606 in the hotel, everything is in its original setting, like a museum. Fritz Hansen designs new rooms for the hotel as well. In addition, it cooperates with many Danish designers such as Cecilie Manz in Copenhagen.

Thirdly, the industry has a business environment dimension. The environment is created by the Lifestyle and Design Cluster under the management of the European Commission. They are responsible for improving competitive advantages for the Danish national furniture cluster. They are supported by the design concept A/S and have a network with the Ministry of Higher Education and Science (c.f. Homepage of Lifestyle and design cluster[3]). They have won a gold label from the cluster assessment institution, indicating cluster excellence. Their objective in the European Commission is to create growth and development via bridging activities and network between companies and knowledge-, research and educational institutions (European Cluster Collaboration Platform 2017; 2023). The total number of members in the Lifestyle and Design Cluster in Denmark is 441. Among them, the number of small- and medium-sized enterprises (SMEs) is 277, the number of large company members 41, the number of research institutions 12, and the number of other ecosystem actors 111 (c.f. European Cluster Collaboration Platform 2017). The main international countries cooperating with the Lifestyle and Design Cluster in Denmark are Asian countries – China, Hong Kong, Japan, South Korea and Vietnam. The transnational cooperation countries are all from Europe, being Austria, Finland, Latvia, Poland and Sweden (European cCluster Collaboration Platform 2017).

[3] *https://ldcluster.com/en/about-us/*.

They have also applied to the Danish business promotion board to design the furniture industry as a national cluster within the business and technology area 'Design, fashion and furniture'. Their vision is that active companies in the cluster will be among the most innovative in the world through new knowledge and ideas, thereby gaining commercial success and ensuring a sustainable focus. They have identified three professional areas of action: design and entrepreneurship, circular economy and digitalisation, and new technologies (Danish Business Promotion Board 2024).

Furthermore, from the perspective of Porter's value chain, the companies can gain value from the input (such as cooperating with Danish leather suppliers); production (such as concentrating production outside Copenhagen and Aarhus); design (such as cooperating with Danish designers); promotion (such as concentrating promotion in Copenhagen and Aarhus); sales (such as cooperating with Danish hotels); and transportation (such as consolidating transportation), as mentioned above. Therefore, companies can improve every part of the value chain from the agglomeration through intensive linkage nationally. The whole of Denmark can for this reason be considered a national cluster.

However, according to Jacobs' theory (1969), Denmark cannot be seen as a cluster since there are no diversified knowledge spillovers across the different industries. The interconnection between different companies from related industries like leather and the hotel industry is just vertical integration based on Porter's cluster theory, which does not show interconnections between diversified industries like cooperation between high tech and low tech industries. According to MAR externalities, Denmark as a country is, of course, not an industrial district. For these reasons, the Danish furniture industry can only be taken as an agglomeration according to Jacobian and MAR externalities.

6 Analysis of the Competitiveness of the Regional Clusters in West Jutland

6.1 Location Analysis of the Regional Clusters

From the value chain point of view, Hedemann and Nissen (2013) think that the cluster has already moved from West Jutland to the big cities Copenhagen and Aarhus. In Denmark in the 1990s, wooden furniture clusters were in West Jutland. However, in 2008, the Danish furniture companies instead started clustering around Denmark's principal cities, Copenhagen and Aarhus. The main reason is that, though location is not something that can directly make companies more profitable, attracting employees can put them in a more advantageous position. The companies have faced a challenge in recruiting new employees from the small towns in West Jutland. For this reason, they needed to be located in big cities. To prove this point, Hedemann and Nissen (2013, p. 25) cite words from the CEO at BoConcept, whose headquarters is in Herning in West Jutland:

> *"No, this location is not something we benefit from, as a matter of fact in terms of the people (employees) we need to attract we would be better off located in Aarhus."*

There is an increasing number of showrooms of larger companies and design and trading companies in these two big cities. However, this increasing number is not caused by the changing location of the furniture producers from small cities. Professor B from Copenhagen Business School thinks that in all the manufacturing industries in Denmark, there are always old companies leaving and new companies entering the market. The companies have not changed their location from city to city. For example, the headquarters of BoConcept is still in Herning in West Jutland; it just has showrooms in Copenhagen and Aarhus (Homepage of BoConcept[4]).

The data from Statistics Denmark can prove this situation in the two big cities: The number of companies in Copenhagen is increasing, rising from 243 in 2013 to 326 in 2022; in Aarhus, however, there is even a small declining trend, from 121 in 2013 to 108 in 2022. The number of companies in the province of West Jutland has not changed much in recent ten years (2013–2022), fluctuating roughly between 200 and 220. In the major cities in West Jutland, only in Herning has the number of companies slightly decreased, from 45 to 33. In Ikast, the number has increased from 18 to 23. In Skive, the number of companies constantly fluctuates between 24 and 28 (Table 2). Therefore, the data does not support the opinion of Hedemann and Nissen (2013). The rising number of the companies in Copenhagen is not due to the decreasing number of the companies in West Jutland, and there is no increasing number of companies in Aarhus.

Years / Regions	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Copenhagen	243	258	258	265	279	300	293	302	321	326
Aarhus	121	122	127	125	120	116	109	100	105	108
Province West Jutland	217	207	202	202	196	204	214	210	207	220
– Herning	45	46	42	39	34	32	35	36	35	33
– Ikast	18	21	18	16	16	21	23	22	23	23
– Skive	25	24	26	28	25	26	25	26	26	28

Source: Statistics Denmark, 2024

Table 2: Number of the furniture companies in the related regions in Denmark

Furthermore, the companies do not need to change their location in order to access employees. Human resources are traditionally available in the small cities. Access to human resources is not a big problem. Most of the companies have designers, sales and management staff from the location of their production factory. If they want access to employees such as designers in the big cities, they can do it through the internet. Alternatively, they can travel to the big cities, since it is not a big distance. It is not necessary for specialised personal to be physically located at the production plant.

It is true that some of the larger companies can increase profits by attracting employees in Copenhagen and Aarhus. However, these employees are those with the skills of export,

[4] *https://www.boconcept.com.*

design, sales or administration in their showrooms. This means that only the design, promotion and sales parts of the value chain can be improved: it does not mean that all parts of value chain can be improved this way. As mentioned in the national cluster analysis, each part of the value chain can be improved through the cooperation of the whole country.

In addition, the promotional activities of the Lifestyle and Design Cluster in Denmark are concentrated in Copenhagen and Herning. It is believed that the cluster in Skive has disappeared. However, the number of the companies in Skive as showed in Table 2 and the largest company located in Skive – Magnus Olesen – proves the existence of the cluster. This firm mainly manufactures independently; sometimes there is cooperation in production with other producers in the cluster. For example, for a product with a short life cycle, the firm will choose producers nearby to produce for them instead of investing in production itself. Its outsourcing in the cluster is to a large extent within a radius of 50 km, which is a short distance. Therefore, the cost of transportation is low. In addition, it does not cost much to search for information about subcontractors. Communication between the firm and subcontractors is smooth since there is tacit knowledge within the cluster. The firm can also switch its subcontractors freely since there are many furniture producers in the cluster. Members of the cluster can access skilled employees. For Magnus Olesen, hiring skilled employees is easier in the cluster. Skilled employees refer mainly to craftsmen. Access to this kind of low-cost and high-quality labour is the main advantage for Magnus Olesen of being located in the cluster.

There are four ways for companies to access employees. The first is through the technical school: the technical school in Skive College trains its students so that they can work in the industry and private companies or start their own company. The companies can also use students from the school as apprentices (cf. Homepage of Skive College,[5] 2024). Furthermore, there are trained employees from the big company. For example, Magnus Olesen is considered the "Rolls Royce of Salling". Many entrepreneurs in Salling can use employees trained by Magnus Olesen. A generation of people descending from or educated by Magnus Olesen today run furniture firms in the Salling district (Lorenzen 1999). Thirdly, companies can access workers through the exchange of employees with other companies in the cluster. Finally, there are local unions and the Skive job centre in the cluster that can provide human resources (Lorenzen 1999; Homepage of Jobcenter Skive,[6] 2017).

There are also trust relations between the companies. Companies have personal relationships with one another. As mentioned, Magnus Olesen has trained many employees for other companies, and some of its former employees have started their own furniture companies in the cluster. In addition, there is the exchange of employees among companies. The trust relations in the cluster form tacit knowledge. The companies can help each other: for example, one company helps another company without payment, and the assisted company will reciprocate.

In addition, they can also access the support from different levels of government – not financial support but support in the form of information, mainly about product development know-how. Companies in the cluster can also consolidate their transport etc.

[5] *https://skivecollege.dk.*

[6] *http://jobcenterskive.dk/.*

Therefore, it is significant that the headquarters and production facilities of the furniture companies in West Jutland have not moved to Copenhagen and Aarhus. They have not disappeared either. The regional clusters are still in West Jutland. The area around the provincial towns of Herning and Ikast, as well as the area around Skive and the Salling Peninsula in West Jutland, represent the major furniture clusters (Lorenzen 1999).

6.2 Definition of the Type of Regional Cluster

The region does not have a diversified production structure since the cooperation between companies is in the form of vertical integration of companies from the same industry. Therefore, they cannot be considered a cluster according to Jacobs' theory. Whether it can be taken as an industrial district according to MAR's theory depends on the companies' size. As already mentioned, Marshall's industrial district theory is focused on small- and medium-sized enterprises (SMEs). Magnus Olesen is the largest company in the region. However, compared to the largest in Denmark, Fritz Hansen, it might be seen as a medium sized company.

Meanwhile, according to BoldData (2024), Magnus Olesen is not among the top 50 largest furniture companies in Denmark. Therefore, all the companies in the region can be taken as SMEs. In addition, they cooperate and compete in the special atmosphere. There is inter-firm circulation of skilled labour, easier access to suppliers and knowledge spillovers from the network with the other companies, institutions and government. Therefore, it can be taken as an industrial district. However, Magnus Olesen can be considered a large firm from the point of view of the region. Meanwhile, as Porter said, the industrial district may face challenges against the globalisation background, since the companies need to be more or less globalised to gain competitive advantages. Magnus Olesen, for example, outsourced to less developed countries in Eastern Europe and China. This means that the region is not a traditional industrial district; it has the characteristics of the cluster. Therefore, it can be taken as a cluster.

6.3 Different Opinions on the Competitiveness of the Regional Clusters in West Jutland

There are both positive and negative opinions about the clusters in West Jutland. Howells and Hedemann (2008) think that the decline of the West Jutland furniture manufacturers in Denmark is evidence of the limited value of learning within clusters. The compensating economic activity comes from the rise of large international firms. They are not geographically clustered and are without any apparent important relationship between them.

There is the opposite opinion from the professor A in Copenhagen Business School that states that the competitiveness of the regional clusters has not diminished. They are under strong competitive pressure, and this makes them innovate constantly to survive.

In order to judge which point of view is consistent with this analysis, it is necessary to look at employees in the furniture industry with Master's and PhD degrees. The reason

for analysing these data is that the education level can reflect the innovation capabilities in different regions. Education has a very strong correlation with skills and the use of technologies in various spheres of life. The role of education and skills in promoting innovation is critical. Education and research are key drivers of economic growth (OECD 2016; Cohen 2006).

As shown in Table 3, the number of employees with Master's and PhD degrees in the furniture industry in Copenhagen increased from 161 in 2013 to 562 to 2022, while in Aarhus it rose from 233 to 476 in the same period. The number in West Jutland also shows an increasing tendency, from 82 in 2013 to 199 in 2022. Among the major cities in West Jutland, the number in Herning increased from 25 to 70; in Ikast, it increased from 8 to 22. In Skive, even though the number is not large, it does not show a decreasing trend, always fluctuating between 5 and 11. The data shows that the number of higher level professionals employed in West Jutland is not shrinking and their innovation is not declining.

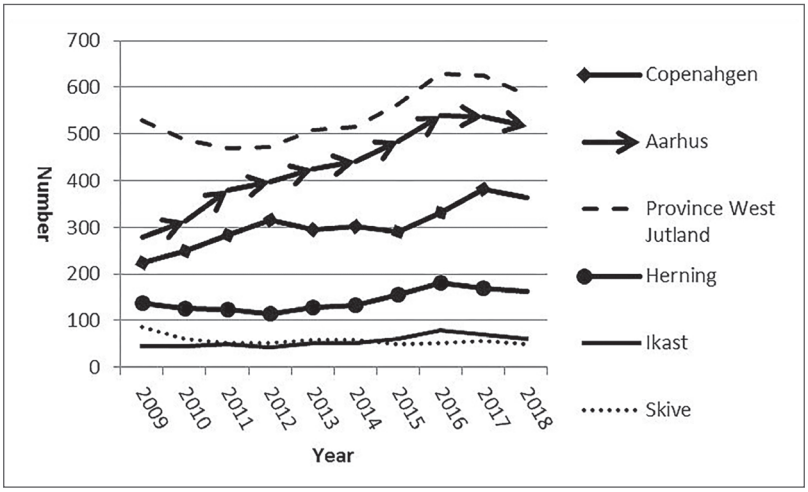
Years / Regions	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Copenhagen	161	170	190	219	261	251	239	242	474	562
Aarhus	233	249	281	328	317	305	339	333	408	476
Province West Jutland	82	88	100	133	135	147	177	177	184	199
– Herning	25	30	32	43	40	44	46	54	62	70
– Ikast	8	8	8	17	13	16	20	21	20	22
– Skive	5	6	7	6	11	10	10	10	8	7

Source: Statistics Denmark, 2024

Table 3: Number of the employed with Master and PhD degrees in furniture industry

Furthermore, the number of professionals and technicians in the Danish furniture industry in Copenhagen, Aarhus, and West Jutland in the last decade also proves this. As can be seen from Figure 1, the number of professionals and technicians in West Jutland, Copenhagen, and Aarhus showed a growth trend. From 2009 to 2011, there was only a slight decline, and thereafter, it continued to increase until 2018. Among the major cities in the furniture clusters in West Jutland, there is a slight tendency towards increasing numbers in Herning and Ikast in general, and in Skive it is almost stable. Therefore, the increase of professionals and technicians in Copenhagen and Aarhus is not due to the decrease in West Jutland and the major cities in West Jutland – Herning, Ikast, and Skive (Figure 1).

In addition, the presence of the furniture company Magnus Olesen in Skive also confirms this. Most of Magnus Olesen's money is spent on research and development (R & D) and design: it constantly updates its production and technology. It invests in factories to maintain a high level of automation. At the same time, its leadership believes that good design is one of its most important competitive advantages. The company uses famous designers who can better interpret its style. Therefore, this confirms the latter point of view.



Source: Statistics Denmark, 2020

Figure 1: Number of professionals and technicians in the furniture industry in relevant cities and in the region of West Jutland

7 Comparing Advantages and Disadvantages of National and Regional Clusters

According to Porter's theory, the companies in the cluster compete individually (Belussi and Caldari 2009; Porter and Ketels 2009). The companies in the national cluster reflected the above situation. They are independent since normally they have formal relations with the other actors (government, suppliers, producers, and distributors). Based on Marshall's industrial district theory, companies cooperate and compete at the same time (Belussi and Caldari 2009; Porter and Ketels 2009). Accordingly, the companies in the regional cluster have close cooperation with other actors and compete.

There are both advantages and disadvantages to these orientations. The producers are relatively independent in the national cluster. This may lead to weak innovativeness in the cluster since most of the firms do not make use of the sharing environment like the companies in the regional cluster. It also gives rise to low cost reduction compared to the regional cluster. On the other hand, cost advantage and differentiation are contradictory. Cooperation means cost reduction; however, cost reduction also means less differentiation. For example, two companies cooperate in innovating design or technology and so the new design or technology is available to both of them. It does not make one of them more special than the other. Therefore, for strong producers who have enough capacity to do everything themselves and want to be distinguished, cooperation is not so important. However, cost reduction in activities with low techniques or without techniques is good, such as cooperation in producing low-tech products and transportation.

8 Conclusion and Policy Suggestion

The furniture industry in Denmark can improve its competitiveness through a national cluster. The whole industry can be considered a national cluster, according to Porter's cluster theory. This is due to the whole furniture industry having three key cluster dimensions, as stated in Porter's cluster theory: geographic, activity and business environment. Meanwhile, companies can gain value from each part of the value chain through the cluster. In this way, the industry becomes more efficient and competitive. However, from the point of view of Jacobs, Denmark is not a cluster since it is not interconnected with the diversified industries. Also, based on MAR externalities, the country is not an industrial district. It can only be seen as an agglomeration according to these last two cluster theories.

The regional clusters' competitiveness is not decreasing. One reason is that the regional clusters have neither moved to the big cities – Copenhagen and Aarhus – nor disappeared. They are still around the provincial towns of Herning and Ikast, as well as in Skive and the Salling Peninsula in West Jutland. A second reason is that these regional clusters have not gradually declined but are constantly reforming and innovating. They are the main driver of furniture exports in Denmark.

The regional cluster can be considered an industrial district if Magnus Olesen is taken as a medium sized company from the point of view of the whole Denmark, since the industrial district is focused on small- and medium-sized enterprises (SMEs) and the region has characteristics of the industrial district, such as inter-firm circulation of skilled labour. However, from the point of view of the region, Magnus Olesen can be seen as large company, and it is not a traditional industrial district since it joined the global production network. Therefore, the region can be taken as a cluster.

Finally, the competitiveness of the furniture industry in Denmark can be improved through both national and regional clusters in different ways. The companies in the national cluster are relatively independent and companies in the regional cluster are cooperatively competing. There are both advantages and disadvantages to being cooperative and independent. Cooperation leads to high innovativeness and cost reduction in the cluster. On the other hand, it leads to low differentiation of the individual company.

In Denmark, governments do not have much control over companies since it is thought that government intervention will distort the natural competition. However, the government can still provide horizontal support that does not distort the market and affect the degree of differentiation of these independent companies. Policies could involve building infrastructure. For example, the government can establish an industrial park for the regional cluster. The industrial park can attract more companies and more subcontractors. If we consider the situation from a broader perspective, the government should make use of the advantages of the national and regional cluster to build a complete ecological production and logistics chain which integrates scientific research and innovation. The government should also communicate the concept of the cluster to Danish companies. Even though the concept is well known in the scientific field, during the interviews with Danish companies, nobody knew about it. Thus, it is important to convey the information

to them. In this way, they can consider designing company strategies to benefit the cluster and the company at the same time.

The support could be vertical, establishing networks between experts who are researching the furniture industry and the companies, since the interviews found no such connection. For example, if the companies communicate with experts doing qualitative research about the furniture industry, the companies can have a clear view of their position in the industry and compose strategies that are more applicable. The government could also consider giving financial aid to companies who strongly innovate and invent to compensate for the leaking knowledge freely used by other companies in the cluster. In this way, further innovation can be stimulated. Furthermore, reputation is very important for the development of a cluster, since it can bring many benefits. However, the Lifestyle and Design Cluster Denmark is responsible for promotion of the national cluster, but mainly for the region of Copenhagen and Herning. There is no institution promoting the cluster in Skive and the Salling Peninsula. Therefore, if an institution can promote for the cluster, the competitiveness of the cluster will be greater. It may also improve the reputation of the entire region and even the country.

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