

# Exploring Competitive Strategies of China Ceramic Tile Industrial Cluster in Global Economy

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## Abstract

**In this paper, we discuss the competitive paradigm between globalization and local development in the ceramic tile industrial cluster, based on the Porter's theory in exploring the factors of the global competitiveness. We analysis the theory of cluster and competitive theory to compare two ceramic tile clusters in different contexts for tracing the mechanism and path constructed ceramic industry international competitiveness and strategy formation. In the study, we discuss what changes come into play addressing the radical changes in world markets, both for ceramic tiles and for surrounding ceramic tile supportive industries. These issues will be discussed with amount of literature reviews through the various perspectives to explore more comprehensive insight to China ceramic tile industry.**

## Keywords

**Ceramic Tile; Industry Cluster; Agglomeration; Competitive Strategy; Resource Based View**

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## 1. Introduction

As the world's largest producer, consumer and exporter of ceramic tiles, the sheer scale of China's volumes has been driving world growth in production, consumption and exports for over 15 years [1]. China's advantages in globalization and international tile industrial transfer and especially the advantage of the low-cost labor force are reducing. Although China has apparent influence on the global tile volumes, however, Italy is a world leader in producing value added ceramic tiles, which manufactured by flexible and innovative small and medium enterprises (SMEs). Porter [2] regarded a nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Moreover, Porter regarded Sassuolo as a prominent Italian ceramic industry cluster to determine how the diamond of national advantage happened. Clusters have a prominent role to interconnect companies, specialized suppliers, service providers, firms in related industries, and associated institutions in a particular field that compete but also cooperate [3]. China also has several ceramic industrial clusters, such as Jingdezhen has been dubbed the porcelain city which continuous development in ceramic arts since the pre-dynastic periods. Technology refinement, urbanization, industrialization and mass-production joined with cultural origin, Chi-

nese's ceramics developed variety of industrial products.

Rapidly, economic growth of China is promoting real estate market and demanding of ceramic tiles. Domestic market's prosperity of China's ceramics industry made the local state encourage constructing more ceramic industrial clusters even without advantages of endowment or techniques. Therefore, counterfeit and cheap products become a general image for Chinese ceramic tiles. Even through, globalized trading activities are leading the Chinese products in many consumer and capital good's sectors of the manufacturing companies to face up to enormous qualitative and quantitative changes [4]. How can Chinese ceramic tile firms succeed in the global marketplace? We have investigated the famous ceramic tile industry cluster-Foshan for exploring competitive strategies in global economy and studied Sassuolo ceramic cluster by various angles. Our research discussed two major concepts cluster and competition of resource-based view, which have gained prestige in the economic and managerial fields since 1990s [5-7], however, mostly were not exploited in ceramic tile industry. In fact, some people might have argued that the ceramic tile industry as a relatively mature, traditional industry, nothing could be further from previous studies. However, the tile industry still growth rapidly both in terms of world production and exports. Strong rivalry among ceramic tile firms grew more intense. We intend to refine the competitive strategies in China ceramic tile districts under globalized economy.

This study is organized into five sections. Following section reviews cluster taxonomy and several theories related to competition. Section 3 illustrates Foshan industrial cluster, mainly based on the literature and interviewed to a number of ceramic firms. Section 4 will describe Italian ceramic industrial clusters and briefly exploit their localization and strategies of export. The final section contains the discussion and conclusions.

## 2. Theory Foundation & Literature Review

### 2.1. Industry Agglomeration and Cluster

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Marshall [8] indicated three different types of transport costs—the costs of moving goods, people, and ideas—that could be reduced by industrial agglomeration. The fourth powerful advantage opens innovation that are empirically identified by intellectual spillovers in Silicon Valley Route 128 [9]. Saxenian [9] described start-ups and SMEs in Silicon Valley, locate near one another to learn and to speed their rate of innovation that “the mysteries of the trade become no mystery, but are, as it were, in the air.” Ellison and Glaeser [10] noted that agglomerations may arise in two ways—cost differences or natural advantages and they propose an alternate measure of agglomeration named EG index. Each Marshallian theory predicts that plants will locate near other plants in the same industry because there is a benefit to locating near plants that share some characteristic [11]. However, coagglomeration patterns means plants are similar to the other plants in their industry along many dimensions. But across industries, plants are similar in some dimensions and not in others. For example, some industry pairs exchange goods but employ very different workers. Other industries hire similar workers but never trade with each other [11,12]. The basic concept of agglomeration economy synonymous means that production is facilitated when there is a clustering of economic activity. Porter [3] defined clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate.

Clusters formed in natural forces, which attribute to competitive advantages or geography reason; alternatively, in policies supports. For instances, clusters supporting policies in China cannot be easily distinguished from more general SMEs supporting tools. In fact, many the most common cluster policies, such as the supply of services, consultancy and training to firms, the improvement of SMEs specialization and cooperation, the technological upgrade and the approach to the international market, are summed up in the law on SMEs stated in the 2002 [13]. In China, local industrial agglomerations are adopted as development tools and driving growth in wide areas. Three basic types are special economic zones (SEZs), Science parks and industrial clusters; the previous two belong a type of regional specialization that is to look at the specialization of economic activities in selected regions. Firms located in the SEZs or Science Parks usually can access to better infrastructure, services and also laws, and regulations use to be more markets friendly, especially for foreign directly investment (FDI)

or firms. Markusen [7] classified clusters into four categories: Marshallian, hub and spoke, satellite platform, and state anchored as **Table 1**. Most studies distinguish them by industrial life cycle, such as agglomeration, emerging, potential, and mature.

In a global economy, country's openness to foreign trade and investment are forcing companies or industries to find more competitive strategies, and intense rivalry to contribute dynamic business environment. Openness enables countries to exploit their comparative advantages, a direct boost to economy-wide productivity. Clusters provide an intermediate unit of productivity drivers between the general business environment quality and firm level sophistication [14]. Russo [15] emphasized clusters play an increasing role in a global economy where the most competitive firms coagglomerated can serve wider markets unprotected across the geographical boundaries, especially among SMEs.

## 2.2. Cluster Capabilities in Resources-Based View

Globalization has encouraged productive fragmentation and intermediate product exchanges. The growth trajectory and local development outcomes of international firms of Sassuolo have combined the external links that incorporate district firms into global commodity chains. Hervás-Oliver and Albors-Garrigós [16] interviewed over 60 managers with R & D background in the Castellon and Emilian for identified a cluster's resources and capabilities. Their research result had indicated that skilled labor availability, social capital, linkages, business sophistication and network effects composed a unique set of resources and capabilities to derive industrial clusters achieved a certain performance level. Porter [3] regarded clusters should combine with theory of competition to conduct localized or specialized competitive strategy in a global economy.

The resource-based view (RBV) assumes that firms can be conceptualized as bundles of resources that those resources are heterogeneously distributed across firms, and that resource differences persist over time [5]. These assumptions have implied that if firms have resources that are valuable, rare, inimitable, and non-substitutable, they can achieve sustainable competitive advantage by strategies implemented [2,5]. By the way of sophistication of business operations and strategies that firm cannot be easily duplicated by competing firms. RBV is an influential theoretical framework for understanding how competitive advantage within firms is achieved and how that advantage might be sustained over time [5,17]. Prior perspective of organization boundaries in RBV focuses on the internal structure of firms rather than outside dynamic network. The new international economics has emphasized the role of geography as a key determinant for the economic performance of industries and as a way to enhance international competitiveness [18]. Whatever, firms' resource leverage cannot take off industry structure and strategic positioning within that structure as the determinants of competitive advantage. The context of rules and incentives that govern firm strategy and rivalry is an important influence on how companies draw on the factor conditions that they face [14]. Resources and capabilities or higher-order capabilities of clusters (Foss 1996) are the result of the combination and interaction of all the localized elements self-reproduced and self-reinforced in the spatial context, including the strategies of located firms (Porter 1990). In addition to

**Table 1.** Four types of clusters.

Cluster growth	Characteristics of member firms	Intra-cluster inter dependencies	Prospects for employment
Marshallian	SMEs locally owned firms	Substantial inter-firm trade and collaboration	Dependent on synergies and economies provided by cluster
Hub and spoke	One or several large firms with numerous smaller supplier and service firms	Cooperation between large firms and smaller suppliers on terms of the large firms (hub firms)	Dependent on growth prospects of large firms
Satellite platform	Medium-size and large branch plants	Minimum inter-firm trade and networking	Dependent on ability to recruit and retain branch plants
State anchored	Large public or nonprofit entity related supplier and service firms	Restricted to purchase-sale relationships between public entity and suppliers	Dependent on region's ability to expand political support for public facility

a. Source: Markusen [7].

strategies of resources administration, SMEs capable competitive advantages from industrial cluster upgrading and prosperity. Finally, when these resources and their related activity systems have complementarities, their potential to create sustained competitive advantage is enhanced [16].

### 3. Ceramic Tile Cluster of Foshan in China

After four decades of undisputed leadership on the world market for tiles, Italy has now sunk to sixth place, behind China, Brazil, India, Iran and Spain. Whereas in 1990 Italy was producing 450 million square meters of tiles, largely for exports, China was producing scarcely forty million square meters of tiles, mostly destined for domestic consumption. By 2012, China had produced 5200 million square meters (sq.) which increased 8.3 percent, slower growth than during the previous two years, equivalent to 46.6 percent of world production. The growth in domestic consumption was just increased 6.3 percent, estimated at 4250 million square meters, which occupied 38.9 percent of world consumption [1]. Although China's exports have increased from 830 to 915 million square meters, corresponding to 38.8 percent of world exports, the export growth rate of China was 16 percent in 2011 compared with 10.2 percent in 2012, which has declined [1]. China's change was sourcing from economics openness and policy altered. Since 1980s to 2000s, many new firms entry into the ceramic tile industry in China, especially in Eastern China. The external element mainly attributed to the automatic manufacturing line and avant-garde machinery adopted for quality promoting which imported from ceramic district of Sassuolo. The efficiencies and quality had improved in 1990s [19]. Supported by strong inter-sectorial flows of knowledge in the field of machinery manufacturing and by a sharp increase of domestic demand, China is also beginning to produce machines for tile making, copying those developed in the Sassuolo district, which indirectly contributed producer-driven value chain [4]. In the meanwhile, internal factor might be attributed to two dimensions: organization's structure change and lower entry barriers. China's government liberated some state-own firms to be private-own; the organizational renovation of ceramic tile firms made the amount of skillful labor forces became the entrepreneurs. The entry barriers of this industry-initial capital and know-how acquire relatively almost insignificant. The protagonists of this process in China, the amount of entrepreneur lack of innovative idea and ceramic domain knowledge were the scene among ceramic tile firms under rapidly economic growth in 1980s to 2000s.

In this rapidly growing market, main manufacturers in China are concentrated in two major areas: Foshan and Eastern China. Foshan has a long history of ceramic fabrication, and is crowned the name of "Capital of Ceramic of China" which is the third-largest city in Guangdong. The ceramic relations mainly centralized in Chancheng District where combine two towns of Nanzhuang and Shiwan since 2003. Nanzhuang is the greatest specialization in tile production of China, which manufactured enormous volume even greater than Italian national production [19]. With respect to Chinese's standards, the level of product quality is medium-high, most renowned brand are made in Foshan, such as New Pearl, New Zhong Yuan, Dongpeng. The trademark "Foshan ceramic" authorized by China's government in 2013. The population advantage, capabilities of technological absorb and nearby city development caused Foshan to become the major leading ceramic tile production districts in China as well as in the world market. Ceramic tile cluster of Foshan was a typical type of Marshallian district, which creates a local pool of skilled workers, allowing the possibility of sharing investments in new and expensive machinery, and the creation of an 'industrial atmosphere' that enhances knowledge spillovers [20]. Foshan has taken the advantages of its low cost by mass production, low cost of labor, and rich raw materials with local made machinery, making Foshan manufactured over 30 percent tiles in domestic production and occupied over 70 percent in domestic export.

Local learning through ceramic communities of practice within the industrial district might be conducive to incremental innovation, such as a paradigm of Sassuolo. However, "imitating-modifying" is the common approach of learning leads homogeneous product and resulted excess supply with falling price. The SMEs in Foshan adopted OEM/ODM to export to global market, alternatively; the enterprise group or celebrated brand preferred domestic markets. Another feature varies from Italian pattern is the channel of distribution, building materials supermarkets or state exhibitions are the important channel for Chinese producers. Price's bargaining is normal for ceramic tile's transaction. Low switching costs for customer and dynamic real estate market derived unpredictable tile demanding. Asset's specialties of ceramic tile production made those SMEs to hold up over-production in losing money risk.

Overproduction also caused serious environment issues in those districts. Guangdong state government perceived poor quality of ceramic tile product derived from perfect competition without clear enough standards of product and environment. Therefore, government issued several policies about industry's upgrading; raw material administration and energy and reduces carbon emissions in 2009. This policy had moved 87 ceramic firms and dismantled 269 kilns and 155 powder silos [21]. The challenge, moreover, is both direct, concerning the products themselves, and indirect-industrial structure, through the interrelations among the various markets, for raw materials, components, equipment, and final consumer goods. In China, regarding to Foshan, which is strong in branding and properly extending distribution channel systems. Enterprises and manufacturers provide good-quality products by their advanced technology and well organized business management to their demanding markets. Facing future challenges from all over the world, Foshan's core ceramic tile industry must consolidate all advantages of its strong demanding market and the low cost of production capability with market oriented branding strategy to continue taking the lead to the industry.

#### 4. Italian Ceramic Tile District of Sassuolo

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Italian tiles so far are the leading producer in physical characteristics, design, style, fashion, and image. Italy was the first country where tile production moved from craft to industry [15]. Based on formal interview to several managerial level of ceramic tile relations, the average cost of porcelain tile manufacturing are 10 dollars per square meter in Italy, 3.75 to 6 dollars in China in 2006. In terms of general tile products, the average import prices of US were 20.2 to 20.9 dollars by Italy and 8.3 to 8.7 dollars by China. Italian firms achieve the highest average price per square meter, based on the a fact that reflects the higher cost of Italian producers, in particular in terms of high quality inputs for high-end products. Italian firms dominate the France and German markets [1] but have a strong presence in the other high-end global market as well.

As well known, Italy has been the leader in the ceramic tile industry since the middle Ages. The industrial district of Sassuolo, situated in the hilly area between the provinces of Modena and Reggio in Emilia, where 80 percent of Italian tiles are manufactured and from where almost three-quarters of production is exported to world markets. The firms active today number 144, with more than 21 thousand employees and overall sales of more than 4 billion euro. Because of its performance, the process of industrialization in this area has been the subject of innumerable studies and research [15,19,22-24]. The main factors in the development of ceramic tile production in Sassuolo also following the natural advantage geographically: (a) easy access to raw materials (different kinds of clays) in the mountains in that area; (b) an abundant labor force unemployed in that area during the 1950s; (c) housing legislation changed of the early 1960s; (d) tax reliefs lasting till the middle of the 1970s [15].

Sassuolo ceramic tile districts have a unique context of economic, social and institutional features interact at a particular time within Italian historical developments of new techniques. The strong territorial density of firms and the high mobility of technicians, specialized workers and salesmen have created a ceramics "culture" which led to acceleration in the process of imitation. The development of small-medium mechanical industries has benefited at the beginning from the consistent stream of skilled workers available, the greater part of which were trained right from the very beginnings inside the large firms. The presence of this competent workforce and the possibility to continue experiments in the field have thus created conditions for technological development. In 1980s, in addition to the innovative technology of roller kilns used for the single fast firing-leading to energy savings, together with an increase in productivity and flexibility. Another change in the demand for floor tiling from those produced with double firing to those with a single firing. This was achieved also through a general re-design of layouts and of logistics in factories (automation of the handling cycle, stocks, pressings, drying, the choice and packing of materials). Glazed stoneware took place in 1986, which was a milestone of product innovation. Russo [15] deduced ceramic tile industry in Italy was shaped by the technology change, in terms of the process of invention, adoption and diffusion of new techniques in the industry which strengthen the interrelationships between firms and their proximity. In addition to product basis defined "industrial district", the process

of technology change characterized organizational boundaries of firms.

Research developed largely outside the ceramic tile firms, such as the biggest Italian producer of presses for ceramic firms (SACMI). It led the technical evolution of presses; the specialized technical and designing centers that have invented new firing techniques and developed the integrated system kiln-factory. Nowadays, some engineering firms still push forward R & D development for specific ceramic tile factory as an integrated production line. Therefore, the pattern of vertical disintegration has been shaped by technical development through the collaboration of each proximity relation for the product and process specialization of the production units operating in the industrial district. Another important organizational change in the industry occurred during the late 1980s, when the leading firm and the industrial group became the main forces of growth in the local system [25]. There are several international tile groups, such as Marazzi, Florim which have multiple distribution channels and set up flagship store in Milan for extraordinary Italian image. Most of all are SMEs, whereas 353 micro-firms fall below the €2 million threshold. Italian producers of ceramic tiles are deeply integrated in international trade, with 70 percent of total sales represented by exports to foreign markets [25]. Four kinds of actors composed the industrial cluster network of Sassuolo, listed below [26]:

- Companies for the promotion of production settlements;
- Services and local development agencies and structures, such as Demo-center, Assopiastrelle and Acimac in Sassuolo;
- Informative and service desks, such as the provincial Chambers of Commerce and their special agencies;
- Consortiums for innovation and research, such as Ceramic Centre.

Sassuolo is the only one in Europe to have been awarded an Environmental Management Systems certificate, territorially integrated on the basis of the European EMAS regulations. Accordingly, the determinant of Sassuolo ceramic district is that the relations between the producers of machines for ceramic tile making and the producers of tiles, is also can imply to other ceramic production systems, such as Foshan ceramic tile industrial clusters in China, where is imitating technological changes of strategy on the part of the various actors in the Sassuolo district [4].

## 5. Discussion and Conclusions

Sassuolo ceramic industrial district has three benefits: first-mover advantage, tied-up proximity network of core industries within formal association and informal collaboration based on the trust and positive competitive environment. “Italian made” not only the quality reflected, but also contributed from first-mover with cultural reason. A strong network tie reduce the transaction costs that firms in industrial districts enable them to reap external economies of scale that can grant them lower costs than other competitors that are not geographically concentrated [18]. Global competitiveness regards trade protection, environment regulation’s standards, and intelligent properties related legal issues that are out of our discussion.

We do concerns about what to do and how to do in the industrial clusters of China that can support firms gain competitiveness through integrated arguments by literature reviewing and several semi-structured interviews. Foshan ceramic tile cluster also features skilled worker’s availability, construction demanding by near urban area, tax reliefs of export and easy access to raw materials and utilities (coal gas by colliery); machinery firms and glazing relations industry boosted with demanding of ceramic tile in eastern of China. Foshan ceramic industrial clusters are being the first-mover to other ceramic clusters in China respectively. Development trajectory of Industrial district of Fohan seems very similar with Sassuolo. However, strong demanding by domestic market derives enterprise group or big firms to devote to earn easy money in China’s markets. On the contrary, SMEs lack of resources based capabilities to compete with big firms, so they endeavored to do OEM, lower price products of low quality or unglazed polished porcelain for third party of other nations those are the major products of “Chinese made tile”. Firms has been shaped strategic and elastic that can quickly response to challenges of nearby competitors. Furthermore, three benefits get into a positive loop for achieving successful geographical concentration. We summarized the cluster paradigm of two clusters for comparison as **Table 2** as follows.

Industrial cluster within sustainable competitiveness should be coexisting multiple sizes, various functions of firms and association with positive social interactions. There still is much to learn about clusters in the global economy with consolidated implications to rich the theories. Future research can offers more insight by different approaches to explore cluster’s resources and capabilities from the view of worldwide that could frames clusters

**Table 2.** Two clusters strategy's comparison.

	<b>Foshan, China</b>	<b>Sassuolo, Italy</b>
Cluster paradigm	Cost, economic scale, customized OEM	Style, design, image, tacit knowledge
Main competitive advantage	Cheap price, Brand image for domestic market, Competence of sales reps Customer service; quick delivery	Design and technological leadership New applications for tiles Mergers and acquisitions Diversified brands image, Made in Italy Competence of sales reps Customer service; quick delivery
Distribution channel	Building materials supermarket (international exhibitions) Independent distributor, construction company	Independent distributor, home-center retailer, construction company, company-operated sales center, specialised retail shops offer specification and installation services
Vertical integration	Low	Medium to high
Industrial structure	Few groups, mostly independent private-owned SMEs	Holdings of several specialized, legally independent firms
Internationalization strategy	Big firms major in domestic market; global export mostly by SMEs	Global presence in all potentially relevant markets FDI in main markets

a. Source: Summarized from [19,23].

generally rather than practices in on special targets.

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