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Competitive analysis of the Turkish brick industry—a case study for developing countries

Emel Laptali Oral[a,*], Gulgun Mıstıkoglu[b]

[a]Mustafa Kemal Üniversitesi, İnşaat Mühendisliği Bölümü, Mühendislik Mimarlık Fakültesi, Tayfur Sökmen Kampüsü, Serinyol, Hatay, Turkey
[b]Mustafa Kemal Üniversitesi, Antakya Meslek Yüksekokulu, Serinyol, Antakya, Hatay, Turkey

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Abstract

The aim of this article was to examine the factors affecting the competition in brick industries in developing countries. Turkish brick industry was analysed as a case study within the frame of Porter's five forces model.

A questionnaire survey was undertaken with Turkish brick makers and the results were evaluated by using frequency tables, Likert scale of comparisons and hypothesis testing.

Findings showed that competition between the existing companies in Turkish brick industry was fierce with many similar-sized companies, low entry and exit barriers, increasing threat from the substitute products, and increasing bargaining power of the buyers. Past experiences showed that potential developments in the industry due to integration with EU would additionally be increasing the competition.

Depending on the literature and the questionnaire findings, a number of strategies were recommended to Turkish brick companies, which can also be adopted by the companies in other developing countries.

Keywords: Competitive advantage; Brick industry; Porter; Developing countries

1. Introduction

Brick production worldwide has developed from a cottage industry to a state of the art trade profession. However, developments have not taken place similarly in every country. It is still a cottage industry for some developing countries like Sudan and Nepal. Although not that far behind the developments, Turkish brick industry is still reluctant to adopt the latest technologies and to improve product quality. However, it is at a turning point of which either brick makers will adopt themselves to global competition or get out of the business, as 250 makers over a total of 500 got out of business since the economic crisis in 2002. According to TUKDER (Association of Brick and Tile Makers) [1] this number increases continuously and in case of integration with EU, the number will increase even more as the existing companies are not competitive enough. The case of Portugal is appalling as 330 over 500 makers went out of business during the integration of Portugal with EU although the economical state of Portugal is better than Turkey [2].

It is evident from the case of Portugal that there is an inverse relationship between the barriers of entry and the intensity of the competition. However, competition is not only affected by the barriers of entry but also affected by the power of existing rivals, suppliers, buyers and substitute products of the industry [3]. Thus, an industry analysis is necessary in order to develop strategies. The aim of this research, then, is to undertake an analysis of Turkish brick industry and form a basis for future strategies for brick makers working both in Turkey and in other developing countries. In order to

*Corresponding author. Fax: +90 32 6245 5499.
E-mail address: emellaptalioral@yahoo.com (E.L. Oral).

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achieve this, Porter's five forces model [3] is utilised as a framework.

2. Brick industries in developing countries and in Turkey

The production process of bricks can roughly be divided into six main steps, which are: digging the clay, preparing the clay, forming, drying, firing and distributing the bricks. While many technological combinations are possible during the brick production, the brick makers in developing countries are generally reluctant to adopt new technologies due to the availability of cheap labour. Labour-intensive production, then, results in lower prices but also lower quality of the product.

Another important determinant of the price of the product is the cost of fuel as it accounts, on average, about 30–40% of the total production costs [4] and energy consumption varies depending on the factors like the type of the kiln used, the capacity of the kiln, the firing temperature and the type of the clay used [5,6]. Although, kiln types can be stated to be the most important factor in energy savings, there is a trade-off between the energy consumption and the investment costs (Table 1). While the use of intermittent kilns are still common in Thailand, Bangladesh and Sri Lanka, countries like India, Pakistan, Bangladesh and Nepal have introduced the use of Bull's Trench kilns [7]. Turkish brick makers generally prefer to use Hoffman kilns, although there are a few number using Tunnel kilns [8].

Use of Tunnel kilns has obvious advantages for high quality, large capacity production with savings in terms of energy and labour, thus preferred by most of the brick makers in developed countries [9]. However, high investment costs of Tunnel kilns are the most important reason for the brick makers in developing countries for not adopting the technology (Table 1). Another important reason is the short supply of liquid oil required to operate these kilns.

Drying is another stage of production during which energy saving can be achieved by trading off the quality of the product. It is a common practice in developing countries to dry the clay in the open air rather than by using drying tunnels. Although this results in energy savings, it requires use of extensive space and labour force and affects the product quality adversely.

There are a variety of applications related with forming the bricks, which takes place before the drying process. While the common practice in Asian countries like, Indonesia and Sri Lanka is still forming manually, extruders are used in countries like Indonesia, Vietnam, Thailand and Turkey as in developed countries.

Clay, which is the raw material of brick, has only a share of about 6% of the total production costs [8]. However, it is an important determinant of the location of the brick makers. Brick makers tend to choose sites, which are close to or at the clay source. While the regulations related with the use of clay from the pits/sites vary from country to country, the common problem lies with the exhaustion of the sources requiring abandonment of the sites. It is reported by both FAO [7] and DPT [8] that availability of clay will change in the future and alternative sources of raw materials have to be considered. Although this will be the case for both the developing and the developed countries in the near future, it is to the disadvantage of the developing countries as research and development are far behind the developed world. In developing countries, access to knowledge and expertise is generally an important problem even for the adopted technologies [10]. This also results in a competitive disadvantage against the substitute products. The strongest substitute product, YTONG building board has been increasing its market share since 1997 in Turkey. Turkey is the second largest maker of YTONG after Germany [11]. The weight advantage of YTONG (lighter than brick in weight; weight: 1000 and 400 kg/m^3 for brick and YTONG, respectively) were recognised after the earthquakes in Turkey in 1998. Since then, YTONG's well-organised marketing strategies additionally emphasised

Table 1
Capacity, energy consumption and investment costs of different types of kilns [7]

Kiln type	Capacity '000 bricks (per firing for intermittent kilns	Capacity '000 bricks (per day for continuous kilns)	Specific energy consumption (MJ/kg)	
Clamp kiln	5–1000		2.0–8.0	—
Scove kiln	5–100		2.0–8.0	—
Scotch kiln	5–40		2.0–8.0	<5
Downdraft kiln	10–40		2.0–6.0	<20
Vertical Chinese kiln		4–30	0.8–0.9	>4
Hoffman kiln		2–24	1.5–2.8	>80
Bull's trench kiln		10–48	2.5–2.8	>7
High draught kiln		20–40	1.2–1.8	>15
Tunnel kiln		50–150	1.2–2.5	>1000