PERGAMON

Available online at www.sciencedirect.com

SCIENCE DIRECT®

Journal of Retailing and Consumer Services 11 (2004) 269–278

JOURNAL OF RETAILING AND CONSUMER SERVICES

www.elsevier.com/locate/jretconser

An empirical analysis of productivity growth in a Portuguese retail chain using Malmquist productivity index

Carlos Pestana Barros*, Carlos Alves

Instituto de Economia e Gestao, Technical University of Lisbon, Rua Miguel Lupi, 20, Lisbon 1249-078, Portugal

Abstract

This paper estimates total productivity change and decomposes it into technically efficient change and technological change for a Portuguese retail store chain with data envelopment analysis. The benchmarking procedure implemented is an internal benchmarking, where the stores in the chain are compared against each other. The aim of this procedure is to seek out those best practices that will lead to improved performance throughout the whole chain. We rank the stores according to their total productivity change for the period 1999–2000, concluding that some stores experienced productivity growth while others experienced productivity decrease. Managerial implications arising from the study are considered.

Keywords: Chain retailing; Productivity change; Malmquist index

1. Introduction

The Portuguese retail sector is confronted at the present time with several threats that clouds its future independence. These threats are the following: first, the increasing number of major international retailers (in particular, from Spain and France) entering the Portuguese retail market, intensifying the competition and the shrinkage of the margins; second, the small dimension of the Portuguese retailers, which prevents expansion into the European market, lacking the economies of scale that exist for larger operators who can benefit from doing business in several contiguous markets; third, an inadequate state policy that has prevailed in recent years, restricting the growth of hypermarkets and the shrinkage of small grocery stores (Farhangmehr et al., 2000); fourthly, the small dimension of the market and the relative shallowness of disposable income; fifth, the widespread availability of expensive, imported brands of all consumer goods, out of proportion to the market's average purchasing power. This is currently in sharper focus, owing to the effects of a severe economic downturn; lastly, the existing structural rigidities in the labour market.

The national retail industry reacts to these threats by attempting to increase the efficient use of inputs. One procedure to improve competitiveness is benchmarking. Benchmarking is the outcome of an investigation into an industry's best practices, in order that their generalised application might lead to improved performance throughout the whole industry (Walters and Laffy, 1996; Dunne et al., 1992). The efficiency of retail stores is a major theme in contemporary research, i.e. Balakrishan et al. (1994), Athanassopoulos (1995), Kamakura et al. (1996), Thomas et al. (1998) and Donthu and Yoo (1998). Among the benchmarking techniques, data envelopment analysis (DEA), a non-parametric technique, has been used previously, for example in Thomas et al. (1998) and Donthu and Yoo (1998). In the present paper, we analyse the intra-chain comparative efficiency of a major Portuguese retail company, assessing the efficiency of a sample of individual stores by applying a variety of metrics to measure inputs and outputs that combine financial, as well as operational, dimensions. Moreover, we evaluate total productivity with the Malmquist index.

The contribution of this paper to literature on the retail sector is based on the application of the Malmquist index to evaluate retail efficiency.

The paper is organised as follows. In Section 2, we describe the contextual setting, describing the Portuguese retailing sector in order to shed some light on the

*Corresponding author. Department of Economics, Technical University of Lisbon, Rua Miguel Lupi, 20, Lisbon 1200-725, Portugal.

E-mail address: cbarros@iseg.utl.pt (C.P. Barros).

0969-6989/$ - see front matter © 2003 Elsevier Ltd. All rights reserved.
doi:10.1016/S0969-6989(03)00053-5

threats mentioned above. In Section 3, we survey the existing literature on the topic, with a view to highlighting the contribution that the present paper seeks to make. In Section 4, we explain the theoretical framework supporting the model used. In Sections 5 and 6, we present the data and results. In Section 7, we consider the managerial implications of the study. In Section 8, we put forward the limitations and possible extensions of the study and finally, in Section 9, we make our concluding remarks.

2. Contextual setting

On Portugal's accession to the European Union in 1986, the country's retail market embarked on a course of profound changes that are reflected in Table 1. These changes have led to the rapid and widespread expansion of hypermarkets and supermarkets throughout the country and to the concomitant decline of small self-service stores, grocery shops and pure food stores, which were formerly the nation's leading retailers of foodstuffs and other domestic products.

This trend induced a political reaction on the part of the grocery proprietors (i.e. small and medium businesses) whose organisation, the Portuguese Association of Trade, lobbied successfully for the government to delay or slowdown the market-driven evolution from grocery stores to hypermarkets. The result was the laws that restricted the ceiling area in function of the population density (Farhangmehr et al., 2000). These laws remain on the Statute Book today, but the present government has promised their repeal in the future.

Today, the Portuguese retail sector is dominated by five commercial groups which account for most of the country's hypermarkets and supermarkets, as depicted in Table 2. The Portuguese groups among these five large retailers are Sonae and Jerónimo Martins; Competition from overseas exists in the form of the French enterprises, Intermarché, Auchan and Carrefour. Table 2 presents some characteristics of these groups.

Sonae Distribuição is the largest Portuguese retail commercial group, and is part of a conglomerate that has interests in the wood agglomerate industry (in which it is the world leader), media, tourism and construction. In the retail field, Sonae has the large chain of supermarkets, Modelo, including the smaller chain, Modelo Bonjour, in addition to the hypermarket chain, Continente and other, specialised retail stores.

Jerónimo Martins is also a Portuguese group, with minor partnerships with Unilever. It owns the Pingo Doce supermarket chain and the Feira Nova hypermarkets. The Feira Nova chain was obtained through acquisition. This group also manages the cash-and-carry chain, Recheio.

The French group, Intermarché is organised in a mix of franchising and cooperatives, with about 150 stores owned by individual, independent entrepreneurs.

The French Auchan group made its entry into Portugal by acquiring the Pão de Açúcar, a Brazilian hypermarket chain, which had been the first example of such a dimension of retailing in Portugal when its first store opened in 1970. The Group Pão de Açúcar left the market in 1991 with a management buy-out, the chain later being sold on to Auchan in 1997. This is one of the long-established French chains, which has expanded beyond France's borders to create an empire of hypermarkets and supermarkets across the EU. It sold the discount chain operation, Mini-Preço to its rival, Carrefour. Auchan presently has14 hypermarkets.

The third French group in the Portuguese market, Carrefour, arrived in 1990 with a joint venture with a Portuguese bank, but later became independent. They manage hypermarkets under their own brand-name, as well as the soft-discount store chains, Dia and Mini-Preço.

Table 1
Percentage market share (sales) of different types of stores (1988–1999)

Years	Hyper	Supers	Large super	Small super	Self-service	Small grocers	Pure food stores
1988	11.7	18.8	N/A	N/A	19.6	40.6	9.3
1989	16.8	19.5	N/A	N/A	17.8	38.8	7.1
1990	21.1	19.1	N/A	N/A	15.6	38.6	5.6
1991	25	20.7	N/A	N/A	12.9	37.0	4.5
1992	30.9	21.5	N/A	N/A	11.4	31.9	4.3
1993	36.2	22.5	N/A	N/A	10.1	27.0	4.3
1994	40.4	25.2	N/A	N/A	8.7	22.5	3.2
1995	42.4	28.7	14.8	13.9	7.9	18.4	2.6
1996	39.9	33.4	17.9	16.5	7.3	16.0	2.4
1997	37.8	33.8	20.0	17.8	7.2	15.3	1.9
1998	37.8	39.9	21.7	18.2	6.6	14.1	1.6
1999	37.2	42.4	24.1	18.3	6.3	12.7	1.4

Source: Anuário da Distribuição Portuguesa 2001.
N/A = not available.