Towards an understanding of European grocery supply chains

John Fernie\textsuperscript{a, *}, Harry Staines\textsuperscript{b}

\textsuperscript{a}School of Management, Heriot-Watt University, Edinburgh EH14 4AS, UK
\textsuperscript{b}Division of Mathematical Sciences, University of Abertay Dundee, Bell Street, Dundee DD1 1HG, UK

Abstract

Although international retailing has received increased research attention in recent years, there have been few contributions to the academic literature on the supply chain implications of the internationalization process or the variations in logistics networks in different geographical markets. This paper seeks to explore such variations by providing a taxonomy of European grocery distribution networks through the use of cluster analysis on 18 logistics-related variables applied to 10 country markets. The results show that the grocery retail market in Europe continues to exhibit significant differences at the country level. Similarities exist on several variables but there is a high degree of variability between country clusters on the three sub-sets of market structure, trading format and physical/socio-economic infrastructure. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Supply chain; Logistics; Europe; Grocery; ECR

1. Introduction

Throughout the 1980s and 1990s, retail internationalization (RI) has gathered pace as companies have sought growth opportunities outside their home market. Commensurate with this rise in retail activity has been the proliferation of literature on the topic, aptly summarised by two single authored texts emanating from both sides of the Atlantic (Alexander, 1997; Sternquist, 1998). Despite this increased attention upon international retailing, little has been written about the supply chain implications of the internationalization process. Most research focuses upon market entry strategies and motivations behind internationalization. Research is invariably centred on store development and operations rather than the logistical support to stores.

While this research focus is perhaps understandable, it neglects key management decisions which also have to be taken when entering new markets. Will the supply chain have to be re-configured with the creation of a new network of suppliers? How will companies adapt to the logistics environment in these new markets? Issues such as these began to receive more attention in the trade press and through consultancy reports as concepts such as quick response and efficient consumer response (ECR) began to spread internationally. What these studies showed was that countries were at very different stages of the adoption process of these concepts and that logistics ‘cultures’ vary between and within countries.

This paper centres on the European market. ECR programmes commenced in 1993 in Europe, a European Executive Board was created in 1994 and the fourth annual ECR Europe Conference in April 1999 attracted over 2000 delegates who shared best practice principles in logistics. Logistics issues are therefore very much on the agenda of European grocery retailers and their suppliers. Furthermore, it has been argued that ‘Greater Europe’, the enlarged EU of 2010 which could embrace many of the former COMECON nations, could be the battleground for global expansion as powerful European grocery retailers, Metro, Carrefour, Ahold and Tesco, respond to Wal-Mart’s entry into Europe (Poyner, 1998).

This is the geographical context within which the research was carried out. The purpose of the paper is to provide a taxonomy of European grocery distribution networks through the use of cluster analysis on 18 logistics-related variables. By analysing three sub-sets of these variables — market structure, trading format and physical/socio-economic — it is possible to glean an understanding of the similarities and differences between individual country markets.

*Corresponding author. Tel.: +44-131-4513880; Fax: +44-131-4513498.
E-mail address: j.fernie@hw.ac.uk (J. Fernie).
2. Literature review

The research interest in Pan-European logistics was kindled by initial forecasts on the likely impact which the Single European Market (SEM) would have on European businesses from 1992 (Cooper et al., 1991; Cooper, 1993). The removal of trade barriers, the deregulation of transport and the acceptance of uniform standards in information systems were to lead to a rationalization of logistics networks and the increased importance of the logistics service provider.

Throughout the 1990s consolidation has occurred in the European FMCG market and numerous case studies have been cited to show how manufacturing companies have re-engineered their supply chains (Machel, 1993; Harland, 1994; Davis, 1995; Holmes, 1995; Pellew, 1998). While the trend has been for most manufacturing companies to service European markets from a single or limited number of distribution centres, much depends on the nature of the product supplied. For example, food companies continue to retain a country-by-country warehouse structure whereas non-food consumer goods manufacturers opted for either a single site or a European sub-regional solution for multiple sites (Holmes, 1995).

In all of these works, little reference is made to the retail sector. This is not surprising in that the largest European retailers are food retailers which tend to view their operating markets as national markets (this is reinforced by their suppliers as noted above). Moreover, the internationalization of many of these European companies (e.g., Carrefour, Metro/Makro, J. Sainsbury) has been away from Europe to America or Asia.

Few studies have been undertaken of the international logistics strategies of grocery retailers. Fernie (1992) discussed how UK retailers had developed their distribution strategies and how they differed markedly from those of their European counterparts. Seven years later he compared North American and European supply chains to illustrate how logistics practice was being transferred across international markets using examples from Sainsbury, Tesco and Ahold (Fernie, 1999).

During the 1990s the catalyst for industry interest in grocery supply chain management was the publication of the Kurt Salmon Report on Efficient Consumer Response in 1993. Kurt Salmon (1993) estimated that $10 billion could be saved by cutting the throughput time from supplier packing line to consumer in the US from 104 to 61 days. A few months after the publication of this report, the Coca Cola Retailing Research Group, Europe commissioned GEA Consultia to conduct similar research into the European grocery supply chain. Using comparable research methodologies, GEA (1994) estimated that savings achieved through ECR initiatives would be smaller than in the US. Also, unlike the US, no clear program could be applied to all European countries because of the different stages of supply chain efficiency in individual country markets.

Several authors from the Financial Times series of management reports have addressed aspects of logistics trends in different geographical markets (Fiddis, 1997; Mitchell, 1997; Younger, 1997). Mitchell (1997) in particular has attempted to explain the differences between the US and Europe in terms of trade structures, trade practices and regulatory controls.

Fernie (1994,1995) cites the following factors in an attempt to explain variations in supply chain networks:

- the extent of retail power,
- the penetration of store brands in the market,
- the degree of supply chain control,
- geographical spread of stores,
- relative logistics costs,
- level of IT development,
- relative sophistication of logistics service provision.

The first three factors are strategic in nature. The balance of power between manufacturer and retailer has changed markedly in the last two decades with retailers taking responsibility for many aspects of the value chain, including logistics. This is illustrated in Table 1 which shows how European retailers have now grown in economic power to dominate their Pan-European suppliers. Grocery retailers in Europe are no longer small, family-owned companies operating in regional or national markets but large, multi-national public quoted corporations. This power and degree of retail concentration in national markets is uneven however, in that at one extreme the largest supermarket groups in the UK are under investigation by the Competition Commission for their alleged abuse of market power whereas the Portuguese market remains dominated by small, independent retailers.

Commensurate with this shift to retail concentration has been the development of distributor labels. Fig. 1 shows the top 25 grocery retailers in Europe in terms of own label penetration in the packaged goods market. British retailers dominate the list and their brands are premium brands which challenge manufacturers’ brands in terms of quality and price compared with the more ‘copycat’ brands of the French and German retailers (Fernie and Pierrel, 1996). The net result of this shift in retail power and own brand development has been that manufacturers have been losing responsibility for controlling the supply chain. In the UK this transition from a supplier to a retail controlled supply chain is complete compared with some parts of Europe.

In terms of the operating factors listed by Fernie (1994,1995), most are interrelated. The nature of trading formats, the complexity of these at company level in addition to the size and geographical spread of stores will all have a bearing on logistics costs. These costs vary...
Table 1
Comparison of European sales of top FMCG manufacturers and retailers (1993–94)*

<table>
<thead>
<tr>
<th>Company</th>
<th>Sales (bn ecu)</th>
<th>Company</th>
<th>Sales (bn ecu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilever</td>
<td>18.44</td>
<td>Metro</td>
<td>43.40</td>
</tr>
<tr>
<td>Nestle</td>
<td>17.65</td>
<td>Rewe</td>
<td>24.41</td>
</tr>
<tr>
<td>Philip Morris</td>
<td>14.14</td>
<td>Tengelmann</td>
<td>20.94</td>
</tr>
<tr>
<td>BSN (Danone)</td>
<td>10.00</td>
<td>Promodes</td>
<td>20.90</td>
</tr>
<tr>
<td>Procter and Gamble</td>
<td>6.91</td>
<td>Edeka</td>
<td>20.61</td>
</tr>
<tr>
<td>Mars</td>
<td>4.63</td>
<td>Leclerc</td>
<td>19.50</td>
</tr>
<tr>
<td>Allied Domecq</td>
<td>4.48</td>
<td>Intermarche</td>
<td>18.85</td>
</tr>
<tr>
<td>Guiness</td>
<td>3.14</td>
<td>Aldi</td>
<td>16.60</td>
</tr>
<tr>
<td>Grand Metropolitan</td>
<td>4.14</td>
<td>Carrefour</td>
<td>16.32</td>
</tr>
<tr>
<td>Heineken</td>
<td>3.06</td>
<td>Sainsbury</td>
<td>12.02</td>
</tr>
<tr>
<td>Top 10 total</td>
<td>85.59</td>
<td>Top 10 total</td>
<td>213.55</td>
</tr>
</tbody>
</table>

*Mark Up Exchange Rate used: FT 12/10/95.

Source: Fiddis, 1997

**TOP 25 OWN LABEL**

- Cora - 17%
- Co-op - 19%
- Konnár - 20%
- Eroski - 20%
- Auchan - 20%
- Intermarché* - 20%
- Carrefour - 23%
- Basismarkt - 24%
- Lidl - 25%
- Edah - 27%
- Somerfield - 28%
- Monoprix - 30%
- GB - 30%
- Brugsen - 33%
- Delhaize - 33%
- Albert Heijn - 35%
- Casino - 37%
- Asda - 43%
- Safeway - 46%
- Tesco - 56%
- Waitrose - 65%
- Sainsbury - 67%
- TIP - 75%
- Aldi - 83%
- M & S - 99%

Share of packaged goods

Latest financial year on 1995.


Fig. 1. Own-label penetration by retailer.
markedly in Europe according to differences in labour rates, property prices, land costs, interest rates and fiscal policies of individual governments.

Cost savings can be achieved and supply chain efficiency enhanced through greater collaboration between supply chain partners in implementing ECR principles. The ‘enabling technologies’ are a basic tenet of ECR and the degree of usage of EDI, Internet-based information exchanges and the sharing of information between supply chain partners is patchy throughout Europe (Walker, 1994; Mitchell, 1998).

Collaboration amongst retailers and logistics service providers is also uneven throughout Europe in that the vision of the one-stop Mega Carrier for Pan-European provision forecast by Cooper et al. (1991) has not been realized in retailing. To be fair this is largely due to the relatively slow deregulation of some markets, notably Germany.

3. Research methodology

Commensurate with Fernie’s (1994) observations on the major factors which account for differences in geographical markets, an attempt was made to cluster European countries according to a range of logistics-related variables. Eighteen variables were collected from a range of secondary data sources such as Eurostat publications, national trade association data, company annual reports and management consultancy data. The variables were:

- area
- road infrastructure
  - road length
  - road density
- standard of living
- population density
- food outlet density
- dominant trading format
  - supermarket density
  - hypermarket density
  - discount share of domestic market
- own label penetration
- food sales by organizational type
  - multiples
  - co-ops
  - independents
- market share of top five grocers
- development of IT
- degree of overseas involvement
- vertical channel integration
  - turnover % from wholesalers
  - turnover % from manufacturers

The first five variables represent the logistical infrastructure and socio-economic framework within which distribution networks operate. Thus the area, nature of road network and population densities illustrate the opportunities and constraints imposed upon companies which may wish to implement concepts such as ECR. The market structure variables — food outlet density, own label penetration, food sales by type of organization and market share — give an indication of the maturity of food retail markets, the degree of retail concentration in country markets and the extent of retail control over their suppliers. The trading format variables were based on calculations of supermarkets and hypermarkets per 100,000 inhabitants and the share of hard discounters in national food markets. These variables measure the degree of penetration of these formats in country markets and give an indication of the different types of logistical support necessary for each format. The other variables were not classified into any particular group but were used as discriminatory variables in the overall data set. Thus the development of IT is included because ‘enabling technologies’ are key drivers in the implementation of ECR initiatives. Overseas involvement and the degree of vertical integration at the company level gave some indication of how logistics practice is being applied in different markets.

For the basic physical and socio-economic variables, Eurostat statistics gave consistent, comparable data, however, more problems were encountered with market structure and trading format data. For example, different countries have different definitions for a supermarket, superstore and hypermarket and the data were divided into two format types using the floorspace figures of 400 — 2499 m² for supermarkets and 2500 m² and over for hypermarkets. While it was necessary to consult company information, including annual reports, to assess international activity and involvement in vertical channels, this information was also required to establish market share data and to validate inconsistencies in data published by consultancies on own label penetration, sales by the form of organization and IT developments.

Initially it was intended to cover most European countries but the lack of data produced a large number of missing values which narrowed down the choice to 10 EU countries. These were: Belgium, Denmark, France, Germany, Greece, Italy, The Netherlands, Portugal, Spain and the UK.

4. Results

After the collection of the data and its division into sub-sets, cluster analysis was used to classify this material into meaningful country taxonomies. Using the market structure data set as an example, the raw data are exhibited in Table 2 with the figures in parentheses representing a standardisation of the original values ((original value — mean)/ standard deviation) so that, for example,
Table 2
Matrix of variable values for market structure data

<table>
<thead>
<tr>
<th>Country</th>
<th>Food outlet density n/100</th>
<th>Multiples % of food market</th>
<th>Co-ops % of food market</th>
<th>Indep % of food market</th>
<th>Own label %</th>
<th>Market share of top five grocers %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>144</td>
<td>32.7</td>
<td>1.0</td>
<td>66.3</td>
<td>18</td>
<td>40.0</td>
</tr>
<tr>
<td>B</td>
<td>(−0.955)</td>
<td>(−0.417)</td>
<td>(−0.621)</td>
<td>(0.665)</td>
<td>(0.334)</td>
<td>(0.290)</td>
</tr>
<tr>
<td>Denmark</td>
<td>292</td>
<td>37.0</td>
<td>21.0</td>
<td>42.0</td>
<td>18</td>
<td>29.6</td>
</tr>
<tr>
<td>DK</td>
<td>(−0.371)</td>
<td>(−0.229)</td>
<td>(1.974)</td>
<td>(−0.439)</td>
<td>(0.334)</td>
<td>(−0.419)</td>
</tr>
<tr>
<td>Germany</td>
<td>184</td>
<td>41.0</td>
<td>4.0</td>
<td>55.0</td>
<td>23</td>
<td>67.5</td>
</tr>
<tr>
<td>D</td>
<td>(−0.797)</td>
<td>(−0.054)</td>
<td>(−0.232)</td>
<td>(0.151)</td>
<td>(0.897)</td>
<td>(2.168)</td>
</tr>
<tr>
<td>Greece</td>
<td>542</td>
<td>45.0</td>
<td>0.0</td>
<td>55.0</td>
<td>Na</td>
<td>26.0</td>
</tr>
<tr>
<td>GR</td>
<td>(0.615)</td>
<td>(0.120)</td>
<td>(−0.751)</td>
<td>(0.151)</td>
<td>(−0.763)</td>
<td>(−0.665)</td>
</tr>
<tr>
<td>Spain</td>
<td>515</td>
<td>35.0</td>
<td>1.8</td>
<td>63.2</td>
<td>7</td>
<td>36.2</td>
</tr>
<tr>
<td>E</td>
<td>(0.508)</td>
<td>(−0.317)</td>
<td>(−0.517)</td>
<td>(0.524)</td>
<td>(−0.902)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>France</td>
<td>277</td>
<td>68.0</td>
<td>0.0</td>
<td>32.0</td>
<td>20</td>
<td>46.7</td>
</tr>
<tr>
<td>F</td>
<td>(−0.430)</td>
<td>(1.128)</td>
<td>(−0.751)</td>
<td>(−0.894)</td>
<td>(0.559)</td>
<td>(0.747)</td>
</tr>
<tr>
<td>Italy</td>
<td>586</td>
<td>10.0</td>
<td>17.0</td>
<td>73.0</td>
<td>7</td>
<td>22.1</td>
</tr>
<tr>
<td>I</td>
<td>(0.788)</td>
<td>(−1.411)</td>
<td>(1.454)</td>
<td>(0.970)</td>
<td>(−0.902)</td>
<td>(−0.932)</td>
</tr>
<tr>
<td>N’Lands</td>
<td>213</td>
<td>69.0</td>
<td>1.3</td>
<td>29.7</td>
<td>18</td>
<td>36.4</td>
</tr>
<tr>
<td>NL</td>
<td>(−0.683)</td>
<td>(1.171)</td>
<td>(−0.582)</td>
<td>(−0.999)</td>
<td>(0.334)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Portugal</td>
<td>935</td>
<td>10.0</td>
<td>1.0</td>
<td>89.0</td>
<td>1</td>
<td>14.4</td>
</tr>
<tr>
<td>P</td>
<td>(2.166)</td>
<td>(−1.411)</td>
<td>(−0.621)</td>
<td>(1.562)</td>
<td>(−1.578)</td>
<td>(−1.458)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>173</td>
<td>74.7</td>
<td>10.8</td>
<td>14.5</td>
<td>30</td>
<td>38.6</td>
</tr>
<tr>
<td>UK</td>
<td>(−0.841)</td>
<td>(1.421)</td>
<td>(0.650)</td>
<td>(−1.691)</td>
<td>(1.685)</td>
<td>(0.194)</td>
</tr>
</tbody>
</table>

Table 3
Squared Euclidean distance matrix — market structure data

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>DK</th>
<th>D</th>
<th>GR</th>
<th>E</th>
<th>F</th>
<th>I</th>
<th>NL</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>DK</td>
<td>8.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>4.41</td>
<td>12.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GR</td>
<td>5.15</td>
<td>10.14</td>
<td>13.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>3.78</td>
<td>9.65</td>
<td>9.80</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5.37</td>
<td>10.89</td>
<td>5.02</td>
<td>6.95</td>
<td>7.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>11.46</td>
<td>6.79</td>
<td>20.73</td>
<td>8.00</td>
<td>6.29</td>
<td>21.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>5.43</td>
<td>9.12</td>
<td>7.79</td>
<td>5.85</td>
<td>7.49</td>
<td>0.65</td>
<td>19.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>18.25</td>
<td>23.32</td>
<td>32.04</td>
<td>8.05</td>
<td>7.70</td>
<td>28.68</td>
<td>7.29</td>
<td>27.27</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>12.40</td>
<td>8.46</td>
<td>10.87</td>
<td>15.90</td>
<td>17.84</td>
<td>4.42</td>
<td>26.38</td>
<td>3.93</td>
<td>42.65</td>
</tr>
</tbody>
</table>

a large positive number signifies that the original number was large relative to the rest. After these data have been standardized, the Euclidean distance between pairs of countries can be calculated. Table 3 shows the squared Euclidean distance between pairs of countries whereby those countries with small squared distances (Netherlands and France) would be expected to be grouped together compared with the UK and Portugal with high squared distances would be expected to be in different clusters. The average link clustering algorithm was applied to the data from the squared distance matrix.

Univariate Analysis of Variance (ANOVA) was then applied to the data to determine whether there are significant differences among the groups’ means on any particular variable. If significant differences are found, Scheffe’s Analysis of Contrasts is applied to explore the differences. The mean scores for all 18 variables were then calculated for each cluster and tested to ascertain if significantly different means exist (p < 0.05) to assign important characteristics to the clusters.

Table 4 shows the clusters and characteristics for the market structure data. France, The Netherlands and the UK group together on low food density, high own label penetration and predominance of multiple retailers. This indicates that these markets are mature and dominated by a few large retailers which have developed their own label products. Belgium and Germany share two common characteristics with the previous cluster, low food density and high own label.
Table 4
Clusters and characteristics for market structure data

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium, Germany, Denmark, Italy</td>
<td>Low food outlet density, high own label, high co-ops and low multiples share of the food market</td>
</tr>
<tr>
<td>Greece, Spain, Portugal</td>
<td>High food outlet density, low own label, low road density, low standard of living</td>
</tr>
<tr>
<td>France, Netherlands, UK</td>
<td>Low food outlet density, high own label, high multiples share of the food market</td>
</tr>
</tbody>
</table>

Denmark and Italy are grouped together because of the high market shares of co-operative retailers and the low representation of multiples in each of these markets. Greece, Spain and Portugal have high outlet densities and low own label penetration, a reflection of the fragmented nature of grocery retailing in these markets which are still dominated by independently run family businesses. Low road densities and low GDP per capita figures are also significant variables in identifying this cluster.

Table 5 illustrates the clusters from the trading format data. France and the UK are grouped together because of the importance of large store formats in their grocery markets; Belgium, Denmark and Germany are differentiated from this cluster because of the importance of discount formats in addition to hypermarkets in these markets. Somewhat surprisingly The Netherlands is grouped with Italy, Portugal, and Spain for its low hypermarket density. This occurs because of the definitional problems discussed in the previous section. The Dutch have few stores over 2500 m² with an emphasis on large supermarkets. Definitional differences also explain why Greece forms a single cluster. In Greece a supermarket is defined as having floorspace of greater than 200 m², compared with the norm of 400 m². This accounts for the high supermarket density.

The final cluster of countries by physical and socio-economic data are shown in Table 6. Belgium and The Netherlands is one cluster because of high road and population densities. They are also characterized by a high degree of foreign market involvement. France formed a cluster in its own right because of a significantly higher mean score for area than all other clusters. The dispersal of the population is also indicated by the significance of the low population density variable. The countries of southern Europe are grouped together because of low GDP, low foreign involvement and low road and population densities. The other remaining countries (from northern Europe) do not exhibit any statistically significant means.

5. Discussion

The results of the cluster analysis confirm that the European grocery retail market is still strongly marked by differences at the country level. Similarities exist on several variables but there is a high degree of fluidity within and between country clusters on the three sub-sets chosen here. In terms of market structure, the UK has the highest percentage of multiple retailers, the highest own label penetration, the second lowest food outlet density and the lowest percentage of independent retailers. These characteristics coupled with high road and population densities and a dominant trading format, the superstore, have enabled the UK grocery industry to develop a streamlined efficient logistics system. The scale of operations has facilitated the introduction of 'composites' to regional distribution centres (RDCs) whereby products of different temperature ranges are stored under the one roof and distributed to stores in multi-temperature vehicles.

The countries grouped closest to the UK in the analysis are its geographical proximate neighbours, France and the Netherlands. The Dutch, in particular, have similar 'mature' market characteristics to that of the UK and the physical environment is not dissimilar. The main difference is in trading format. The Dutch have not embraced hypermarkets and supermarkets tend to be less than 2500 m². Nevertheless, the Dutch have introduced a modified 'composite' system into their logistics networks in that distribution complexes have been built.
with ambient stream and cold stream warehouses together with recycling centres on the one site.

The French also score highly on market structure variables, hypermarket representation is high but stores are geographically spread over a wide area. In cases where hypermarkets are few in number and are geographically dispersed, some companies have not constructed RDCs but held stock in store. Like companies in the US, forward buying is a feature of French retail logistics and can be attributed to the availability and cost effectiveness of warehouse property to offset inventory costs. It should also be noted that two of the largest French companies are buying organizations with a large number of affiliated independent retailers. In both cases, buying is decentralized and distribution is only partly centralized with store managers doing deals with local suppliers.

It is perhaps appropriate that Wal-Mart chose Germany as its initial geographical market on entry into Europe in view of its high hypermarket density and its strong discounter culture. Nevertheless, Germany identifies with a range of different clusters. It has a high proportion of independent retailers. Similarly, it covers a wide range of formats from small stores and hard discounters to the largest hypermarkets in Europe. As many of the largest German retailers are involved in a multiplicity of formats, their logistics system is complex with product-related warehouses supplying different store types.

At the other end of the spectrum, the peripheral nations of the EU in terms of geography here are also the least developed with regard to market structure and physical logistics infrastructure. Greece, Spain and Portugal are clustered together on most variables.

6. Conclusions

This paper has provided an initial attempt at understanding European grocery supply chains, an area neglected in the international retailing literature. Indeed, much of the research to date has been undertaken by consultants on behalf of ECR Europe or for management reports in the trade press. The value of these works and the taxonomies presented here is that companies entering new geographical markets in Europe will have a better understanding of logistics networks in individual country markets. This will enable them to plan for and adapt to any differences in logistics 'culture'.

The data from the cluster analysis indicate a broad north-south split on most of the variables with Spain, Portugal and Greece clustering together on market structure and physical and socio-economic sub-sets. There is some variability, however, in the northern nations according to dominant trading formats, types of organization, degree of own label penetration, area, road and population densities. European cross border activity has been on the increase throughout the 1990s, however, with Spain, Greece and Portugal being the target markets for investment by retailers from northern Europe, especially French and Dutch companies. This means that these 'immature', fragmented markets are being transformed and logistics practice is being internationalized.

These trends are likely to continue, especially now that Wal-Mart has entered the European market and other large global players realize the potential of an enlarged EU in the early part of the 21st century. Consolidation of the European grocery market is predicted with Pan-European mergers and acquisitions likely amongst some of the largest companies as they combat the threat of Wal-Mart and other entrants. This means that many of the variables in the market structure and trading format sub-sets will exhibit more common characteristics across countries than they do at present. Clearly the results presented here will have to be updated in the near future to test the extent to which logistics networks are being transformed in Europe.

References


