The Existence and Use of Benefit Segments in the Irish Sea Ferry Market

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A programme of advanced study was undertaken in partial fulfilment of the requirements, including literature reviews of previous research (under the direction of Dr. R. Gray) and attendance at relevent conferences and workshops:

The Marketing in Education Group, Services Marketing Workshop. Held at the University of Manchester Institute of Science and Technology, School of Management, November, 1990.

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ABSTRACT

In the last thirty years segmentation has been recognised as a fundamental concept in the understanding of a market. This research undertakes a benefit segmentation of the passenger and freight, sea and air transport markets between Great Britain and Ireland (both Northern Ireland and Eire). In so doing, two areas which have been under-researched are addressed; segmentation in a transport market and the Irish sea passenger and freight market.

The dominant features of the Irish sea passenger and freight markets are identified; seasonality in the passenger market and imbalance in the freight market. The concept of segmentation is applied to the short-sea passenger and freight market and a conceptual model for the research is developed.

Extensive data collection in the passenger markets takes place over a twelve month period. Four surveys are conducted on board ferries (on the Larne-Stranraer, Holyhead-DunLaoghaire and Fishguard-Rosslare routes) and in airport departure lounges (Belfast City airport, Belfast International airport and Dublin airport) at three monthly intervals. Two postal surveys are conducted in the freight market, one addressed to shippers of goods and the other to carriers.

Two sets of analyses are conducted. The first is concerned with presenting an overall profile of the markets and identifying areas where differences occur in the markets. This structural variation is found to exist in the ferry passenger market and to a lesser extent, in the air passenger market. The second set of analyses undertakes a benefit segmentation of the markets.

Benefit segments (groups of passengers and freight customers who choose the service for similar reasons) are constructed for car and foot passengers on each route, business and non-business passengers at each airport, freight shippers, freight agents purchasing air transport services and freight agents purchasing sea transport services. The differing transport service needs of the segments are discussed and comparisons made. The segments are profiled in terms of independent variables. Travel behaviour, buying behaviour and demographic characteristics are used to profile segments in the passenger market. Product characteristics, transport service characteristics and company characteristics are used to profile benefit segments in the freight market. The benefit segments may be used to guide resource allocation for the ferry company by suggesting how the results of the benefit segmentation may influence the marketing mix variables.

Acknowledgments

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Part I

Introduction

Chapter 1

Introduction

In the last thirty years segmentation has been recognised as a fundamental concept in the understanding of a market. The concept of segmentation however, has seen relatively little application in the services sector and the transport industry is no exception.

This research is concerned with a segmentation of the passenger and freight transport market between Great Britain and Ireland (both The Republic of Ireland and Northern Ireland). Despite having played an important and innovative role in the development of short-sea ferry services worldwide (de Courcey Ireland, 1984), Irish sea shipping has been largely neglected as an area for study since the second world war. The physical location of the Irish Sea presents a conveniently defined area for study, incorporating both domestic (Great Britain-Northern Ireland) and international (Great Britain-Republic of Ireland) trade. The ferry industry is highly important to the economies of both Northern and The Republic of Ireland. The Irish sea passenger and freight transport market is comprised of 4 main sectors:

- The sea passenger market: passengers who travel between Great Britain and Ireland (both Northern Ireland and The Republic of Ireland) by ferry.

- The air passenger market: passengers who travel between Great Britain and Ireland by air.

- The freight shippers market (or principals): companies which purchase sea and air transport services between Great Britain and Ireland for goods for which they are either the shipper or consignee i.e., they have ownership of the goods.

- The freight agents market: these are companies which are contracted to transport goods between Great Britain and Ireland. They are largely transport companies or freight forwarders and purchase air and sea freight transport service for goods which they do not own.

The ferry industry on the Irish Sea is extremely competitive, with price being perceived by the operators as the major basis for competition in both the freight and passenger sectors. Quality of service is also cited as being important (Matear, 1987). The high level of competition is a function of the overcapacity which exists on the Irish Sea (Freight News Express, 1987). In the passenger industry this overcapacity is highly seasonal and for very short periods undercapacity may actually exist.

Three major sources of uncertainty confront the market in the medium term:

1. The impact of the Single European Market,

2. Liberalisation of the European air industry,

3. The influence of the Channel tunnel on routes and services with perhaps operators and/or vessels being displaced from the English Channel.

A previous study (Matear, 1987) has indicated the possibility that marketing, as an overall concept, is not being utilised to its full potential on the Irish Sea with marketing tending to be synomonmous with sales and very few operators admitting to having a marketing strategy. This scenario emphasises the need for operators to optimise their market strategies now so

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as to be well placed to take advantage of market opportunities or to defend their market share in the future.

The present study undertakes a benefit segmentation of the sea and air markets with the aim of developing a model which may be used by operators in the formulation of marketing strategies. The model will encompass both the freight and passenger sectors and be directly relevent to management.

The originality of this work lies both in the usage of the Irish Sea as a study area and in the development of a model which incorporates both the freight and passenger sectors. The model should be beneficial in formulating future marketing strategy for the Irish Sea and any other service where there are combined freight and passenger flows.

1.1   Chapter development

The thesis is divided into 4 parts:

- Introduction

- Methodology

- Results

- Discussion

In this introductory part, chapter 2 examines the economic environment within which the Irish sea ferry companies operate and the growth and behaviour of the passenger and freight markets. The concept of market segmentation is introduced in chapter 3 which follows the development of the concept, its growth and application to the Irish sea passenger and freight transport market. Part I of the thesis concludes with the development of the conceptual model and hypotheses on which the research is based in chapter 4.

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The second part of the thesis is devoted to operationalising the conceptual model. Chapter 5 is concerned with identifying and collecting data with which to test the model and hypotheses. Chapter 6 developes the analytical methodology to be employed. At this stage of the research it becomes necessary to treat the constituent parts of the market individually:

- The sea passenger market

- The air passenger market

- The freight shippers market

- The freight agents market

The results of the analyses are presented in part III of the thesis. Two sets of analyses are performed on each part of the market. The first set (chapters 7 to 9) is a preliminary analysis designed to aid in the understanding of the structure and behaviour of the parts of the market. The second stage of the analysis concentrates on the construction of benefit segments in each part of the market.

The final part (IV) of the thesis draws the parts of the market together again in a discussion of the results and implications. The main conclusions of the research are reiterated and areas for further work are suggested.

A schematic structure of the thesis is presented in figure 1.1.

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                        │  Introduction   │
                        │    (Ch. 1)      │
                        └────────┬────────┘
                                 ▼
                        ┌─────────────────┐
    Part I              │   Background    │          Introduction
                        │    (Ch. 2)      │
                        └────────┬────────┘
                                 ▼
                        ┌─────────────────┐
                        │ Literature review│
                        │    (Ch. 3)      │
                        └────────┬────────┘
                                 ▼
                   ┌──────────────────────────┐
                   │    Development of         │
                   │    the benefit            │
                   │  segmentation model       │
                   │       (Ch. 4)             │
                   └─────────────┬─────────────┘
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                        ┌─────────────────┐
                        │ Operationalising│
    Part II             │   the model     │          Methodology
                        │    (Ch. 5)      │
                        └────────┬────────┘
                                 ▼
                   ┌──────────────────────────┐
                   │  Analytical methodology   │
                   │        (Ch. 6)            │
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   Part III    ┌─────────────────┼──────────────────┐          Results
               ▼                 ▼                  ▼
        ┌────────────┐    ┌────────────┐    ┌────────────┐
        │ Preliminary│    │ Preliminary│    │ Preliminary│
        │  analysis  │    │  analysis  │    │  analysis  │
        │Sea passengers│  │Air passengers│  │  Freight   │
        │  (Ch. 7)   │    │  (Ch. 8)   │    │  (Ch. 9)   │
        └──────┬─────┘    └──────┬─────┘    └──────┬─────┘
               ▼                 ▼                 ▼
        ┌────────────┐    ┌────────────┐    ┌────────────┐
        │  Benefit   │    │  Benefit   │    │  Benefit   │
        │segmentation│    │segmentation│    │segmentation│
        │Sea passengers│  │Air passengers│  │  Freight   │
        │  (Ch. 10)  │    │  (Ch. 11)  │    │  (Ch. 12)  │
        └──────┬─────┘    └──────┬─────┘    └──────┬─────┘
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                                 ▼
    Part IV        ┌──────────────────────────────────┐   Discussion
                   │ Conclusions and recommendations   │
                   │          (Ch. 13)                 │
                   └──────────────────────────────────┘
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Figure 1.1: Structure of the thesis

Chapter 2

The Market for Irish Sea passenger and freight transport services

The purpose of this chapter is to examine the Irish sea market for passenger and freight short-sea ferry services.

The UK is The Republic of Ireland's major trading partner, accounting for 42% of her imports and 34% of her exports, yet trade with The Republic of Ireland is relatively minor for The UK, accounting for less than 10% of UK trade with the 'near-sea' countries.

2.1 The passenger market

The growth of the passenger market for both The Republic of Ireland and Northern Ireland is shown in figures 2.1 and 2.2. Both parts of the Irish sea market have shown a net increase since 1975 but the growth of the Northern Ireland market has been more erratic. This market is highly subject to the political situation in Northern Ireland. The lack of growth in the market

from 1967 to 1972 was undoubtedly due to the start of the political unrest in Northern Ireland. The drop in the Northern Ireland market in 1981 can be partly attributed to the 'hunger strike' by IRA prisoners which deterred many people from visiting Northern Ireland.

Figures 2.1 and 2.2 also show how air transport has now achieved dominance over sea transport and that both parts of the sea market are starting to show a decline. It therefore appears that not only are the airlines catering for the new growth in the market but they are also winning customers away from the ferries. Previous research (Matear, 1987) discovered that airlines were perceived to be the major form of competition by the ferry companies, rather than other ferry companies.

Seasonality is the major feature of the Irish sea passenger market (Rich and Matear, 1989), with peak:trough ratios higher than on other European routes. During the 1980's the peak:trough ratios on the Irish sea were in the order of 4-5:1 (Matear, 1987). Seasonality has been a feature of the Irish sea passenger market since the 1850's (MacNeill, 1969). The seasonality of the market is evident in figures 2.3, 2.4 and 2.5 which show recent passenger carryings by Sealink Stena Line on the three Irish sea routes (figure 2.6) operated by the company:

- Larne to Stranraer

- Holyhead to DunLaoghaire

- Fishguard to Rosslare

Seasonality in passengers crossing the Irish Sea is not confined to those who use sea transport. Although seasonality is also evident in the air passenger market, it is not nearly so pronounced. Peak:trough ratios are in the region of 1.3:1 to 1.8:1. The lack of extreme peaks or troughs in the air passenger market may indicate a different type of passenger. It is possible that the more consistent level of the air passenger market is composed of business travel and this is complemented in the summer by holiday traffic. It appears

8

000 passengers

Figure 2.1: The Republic of Ireland/Great Britain passenger market
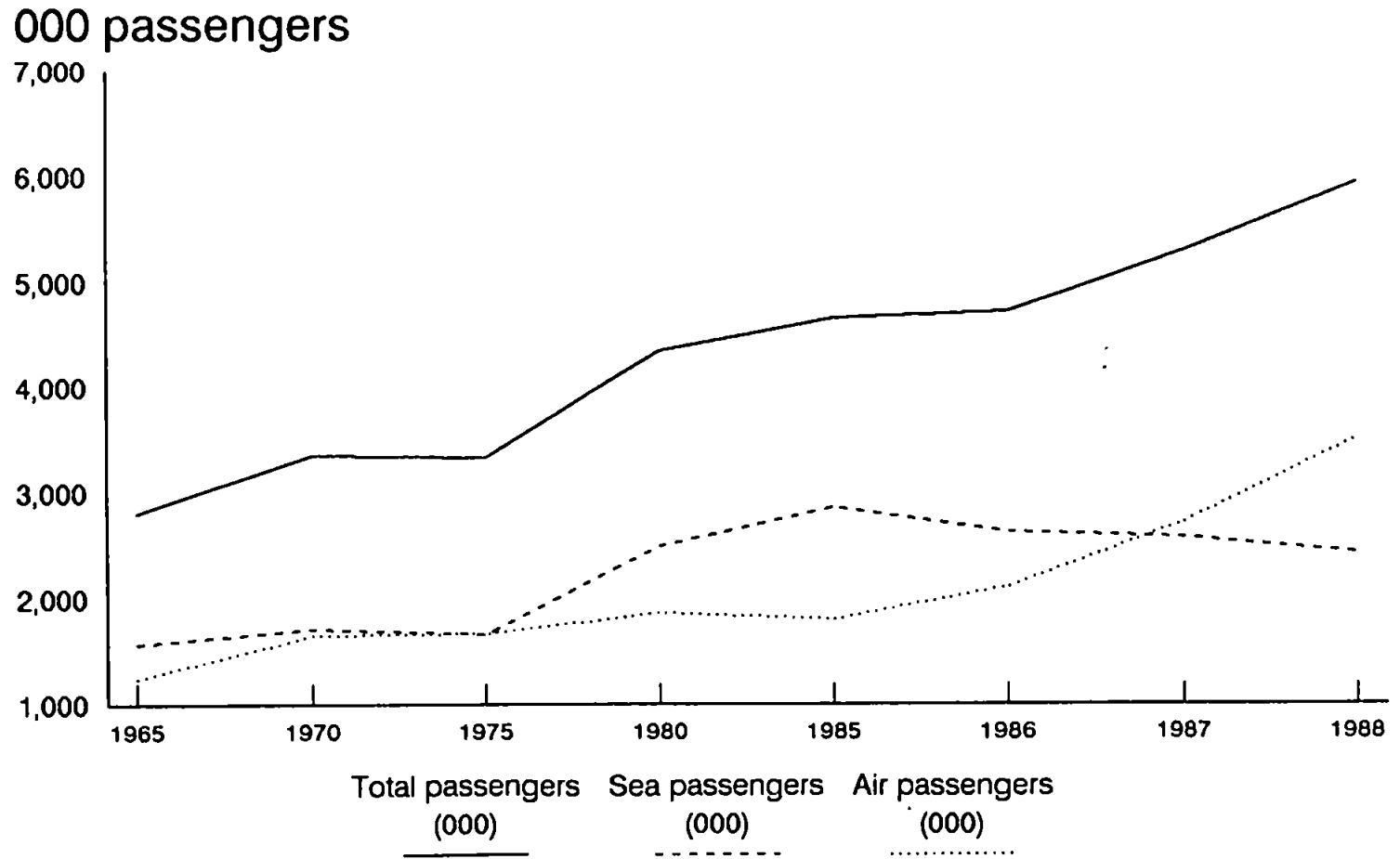
000 passengers

Figure 2.2: The Northern Ireland/Great Britain passenger market
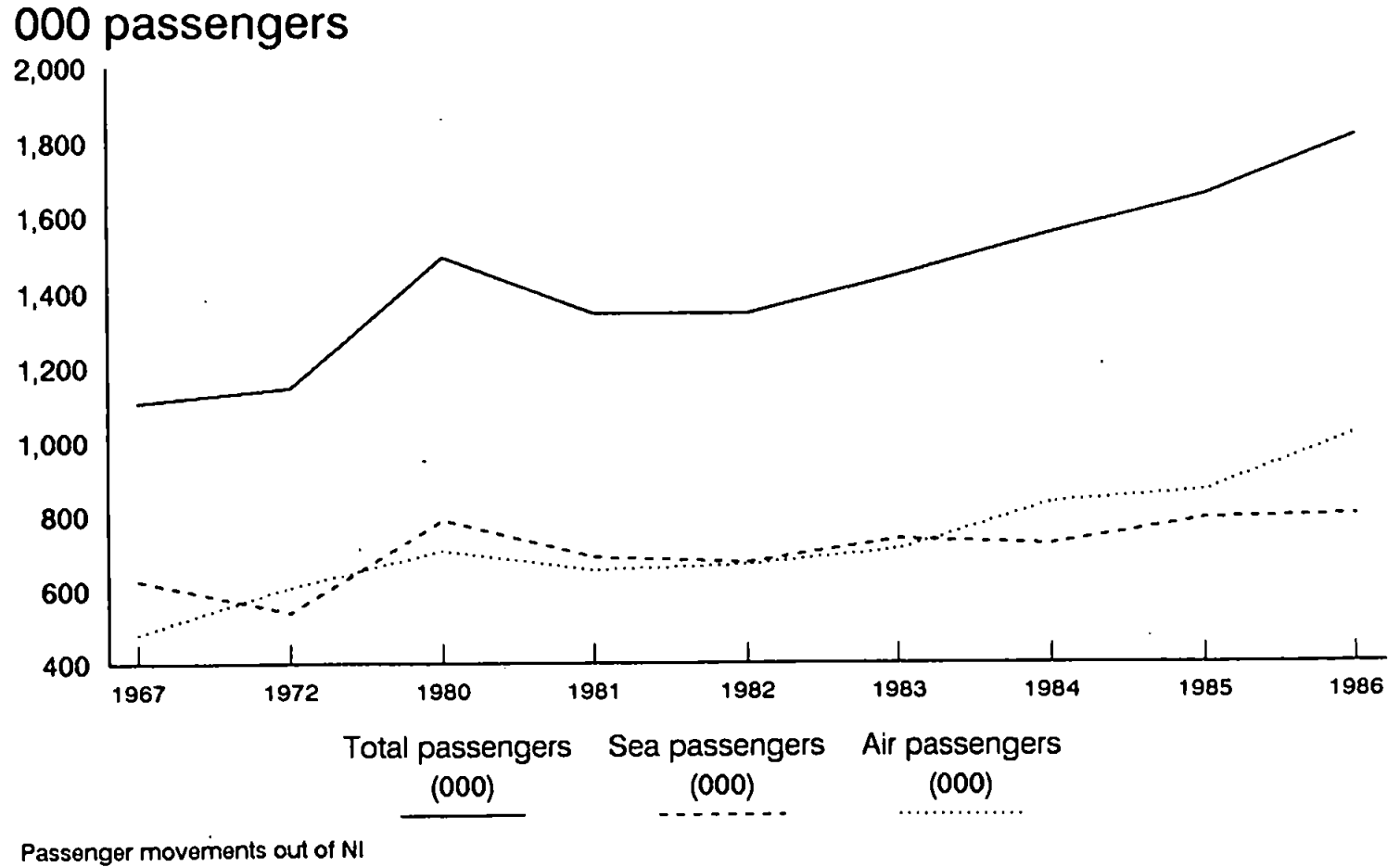
Figure 2.3: Passenger carryings on the Larne-Stranraer route
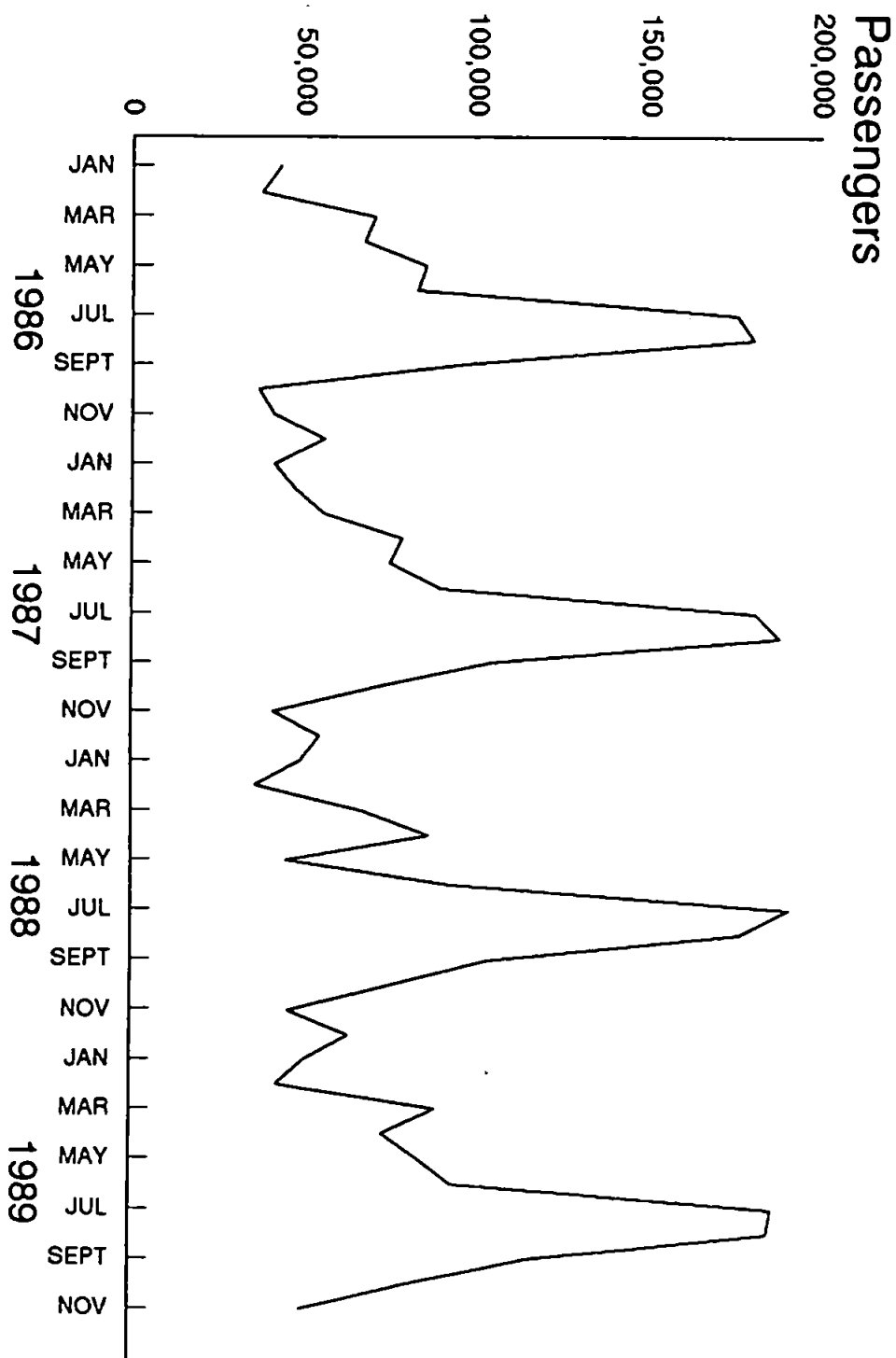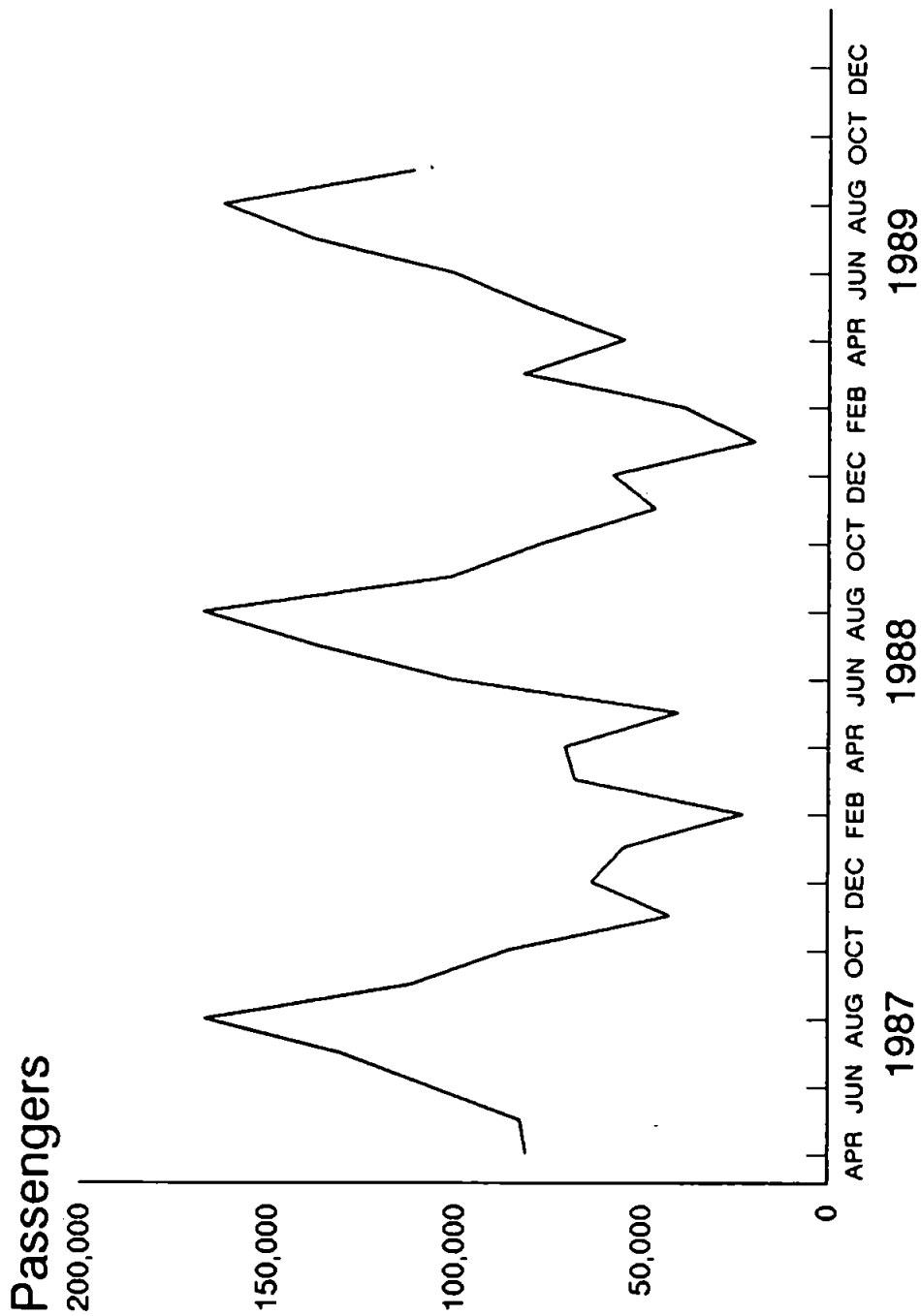
Figure 2.4: Passenger carryings on the Holyhead-DunLaoghaire route

12

Passengers

Figure 2.5: Passenger carryings on the Fishguard-Rosslare route
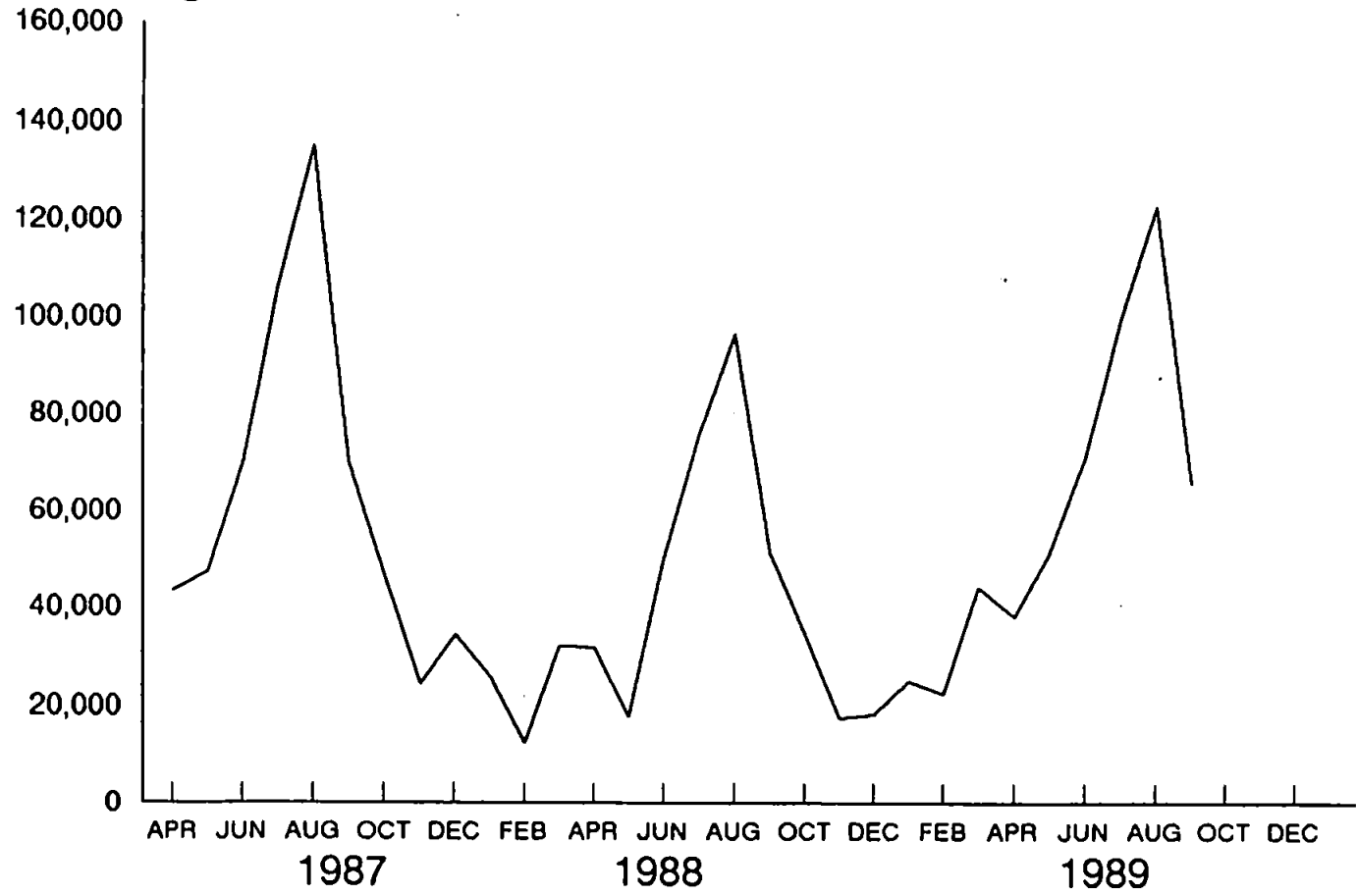
Figure 2.6: Irish sea routes operated by Sealink Stena Line

that the holiday traffic has a less dramatic affect on the air passenger market than it does on the sea passenger market.

Any growth in the passenger market is largely dependent on the efforts of the Northern Ireland Tourist Board and Bord Failte. It is also dependent upon changes in the economic structure of both Northern Ireland and The Republic of Ireland. Real growth in the passenger market must come from outside Ireland, there is a finite level to the number of passengers visiting friends and relatives which traditionally sustains the market.

The Single European market, in particular the ending of 'duty free' concessions will also affect the market. In 1986 almost 50,000 passengers travelled with Sealink on day return trips to Great Britain, primarily to take advantage of the 'duty free' concessions and to shop on the mainland. The seasonality so evident in the passenger market is likely to become less extreme due to changes in the industrial working practices allowing holidays to be more flexible. Opinions are divided as to the effect the 'channel tunnel' may have on the Irish Sea market. Optimistically, it has the potential to stimulate both the passenger and freight markets as Europe becomes more accessible with only one sea crossing involved.

2.2 The freight market

The ro-ro freight market between The UK and The Republic of Ireland has either been static or declining since 1970 (figure 2.7), with the result that, excepting West Germany, The Republic of Ireland is now the smallest of the UK's near-sea ro-ro markets. The decline in the Irish sea ro-ro market is more apparent when considered in proportional terms as in figure 2.8.

Unfortunately, the only general figures available for Northern Ireland cover the period from 1984 to 1986. These indicate that ro-ro traffic in this part of the market is growing steadily. In the past decade the relationship between the ro-ro and the lo-lo market has followed the general pattern of growth

000 units

Figure 2.7: The UK near-sea ro-ro markets by volume

16
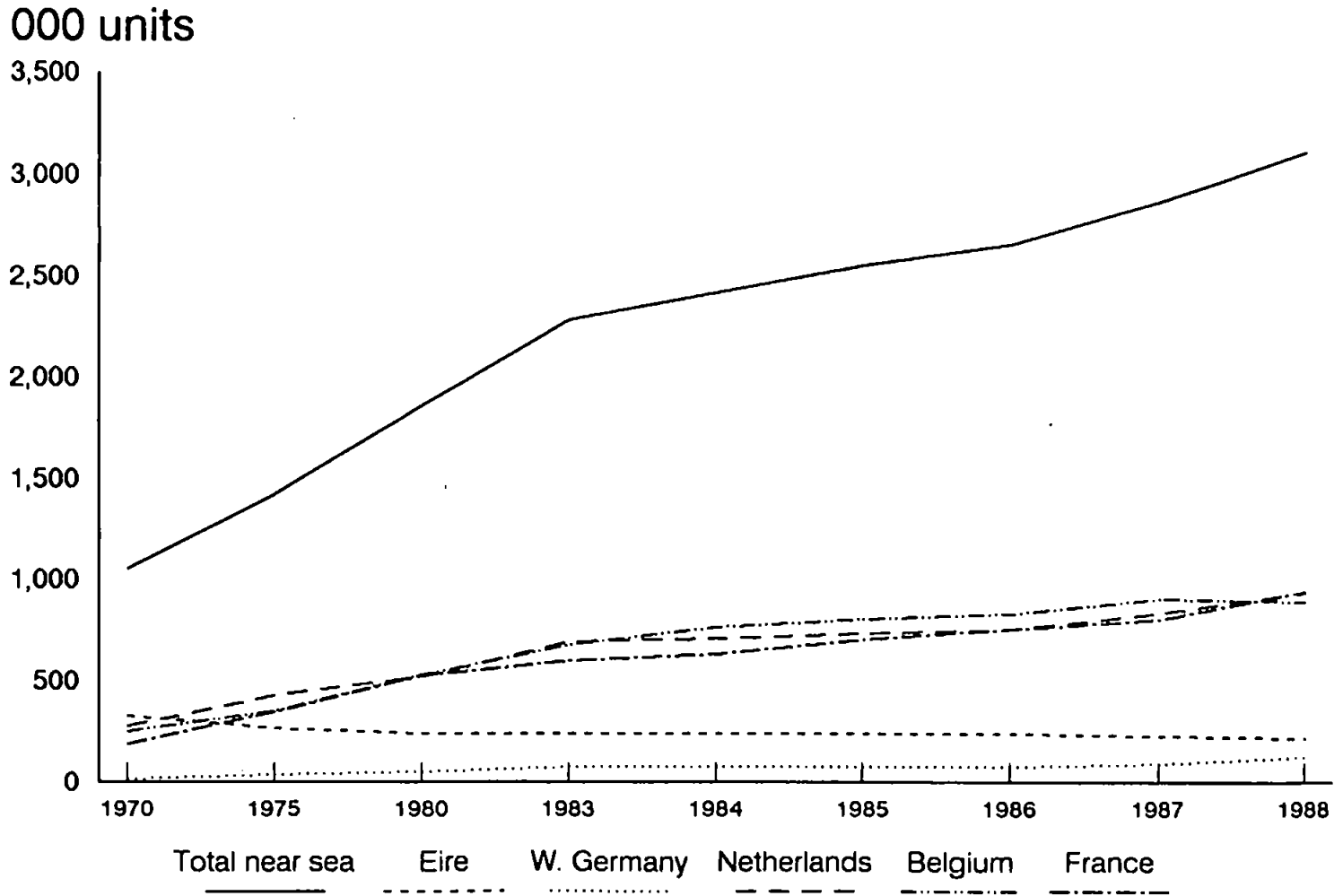
Figure 2.8: Decline in the importance of The Republic of Ireland ro-ro market

%

35

30

25

20

15

10

5

0

1970   1975   1980   1983   1984   1985   1986   1987   1988

Year

Eire   W. Germany   Netherlands   Belgium   France
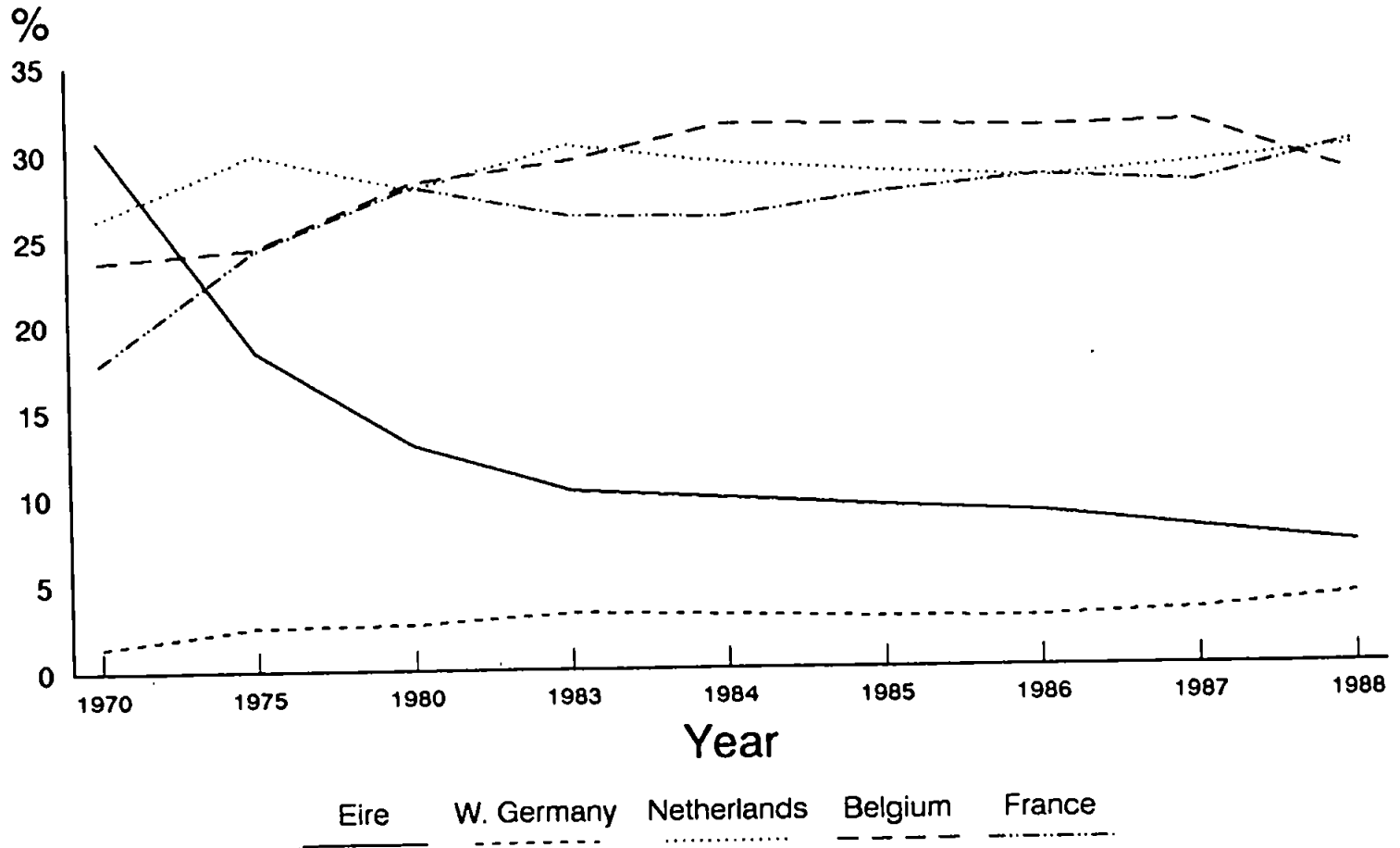
of ro-ro at the expense of lo-lo. The overall tonnage of trade into and out of Northern Ireland continues to grow, from 1985 to 1986, outward at the faster rate.

Figures 2.9, 2.10 and 2.11 show recent commercial vehicle carryings by Sealink Stena Line on the Irish sea. The volume of traffic on the Larne Stranraer route is much higher than on the other two routes. This may be attributed to the length of time taken for the sea crossing, 2 hours 20 minutes as opposed to 3 and a half hours, and the greater frequency of sailings on this route. Larne is Ireland's busiest ro-ro port and handles over 75% of Ireland's total ro-ro traffic (P&O, 1989).

Seasonality is not a dominant feature of the Irish sea freight market. Previous research (Matear, 1987) has suggested a downturn in the market might be expected in July and August. However, this is not supported by figures 2.9 to 2.11.

The major feature of the Irish sea freight market is imbalance. Total trade between The UK and The Republic of Ireland is unbalanced with total imports into The Republic of Ireland from The UK being 2.5 times greater (in volume) than exports from the Republic of Ireland to The UK. From the published figures (eg. Port Statistics, UK Unitized Trade Statistics), unitized trade for both trailer and container markets appears to be fairly well balanced. However, these figures do not indicate what proportion of these containers or trailers are empty. It has been suggested that almost 40% of containers shipped from Ireland could be empty (Containerisation International Research, 1983).

Operators in the freight market are rather more cautious about predicting any growth in this market, yet they insist that they remain optimistic. It is accepted that the lack of new industries, to Northern Ireland in particular, is the major factor in this lack of growth or even growth potential. Trade between The Republic of Ireland and Great Britain is expected to show a small level of growth.

Figure 2.9: Commercial vehicle carryings on the Larne-Stranraer route
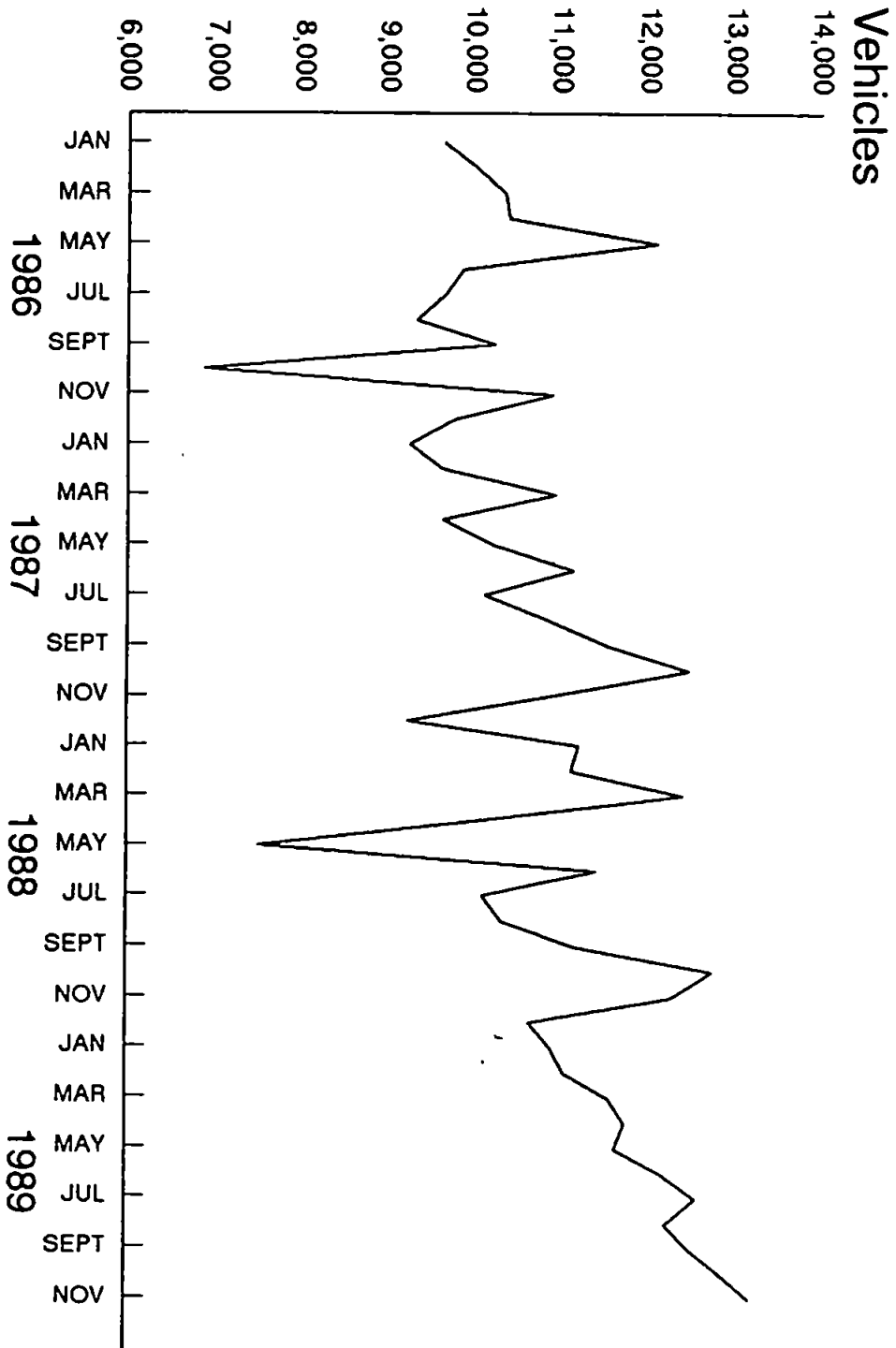
Vehicles
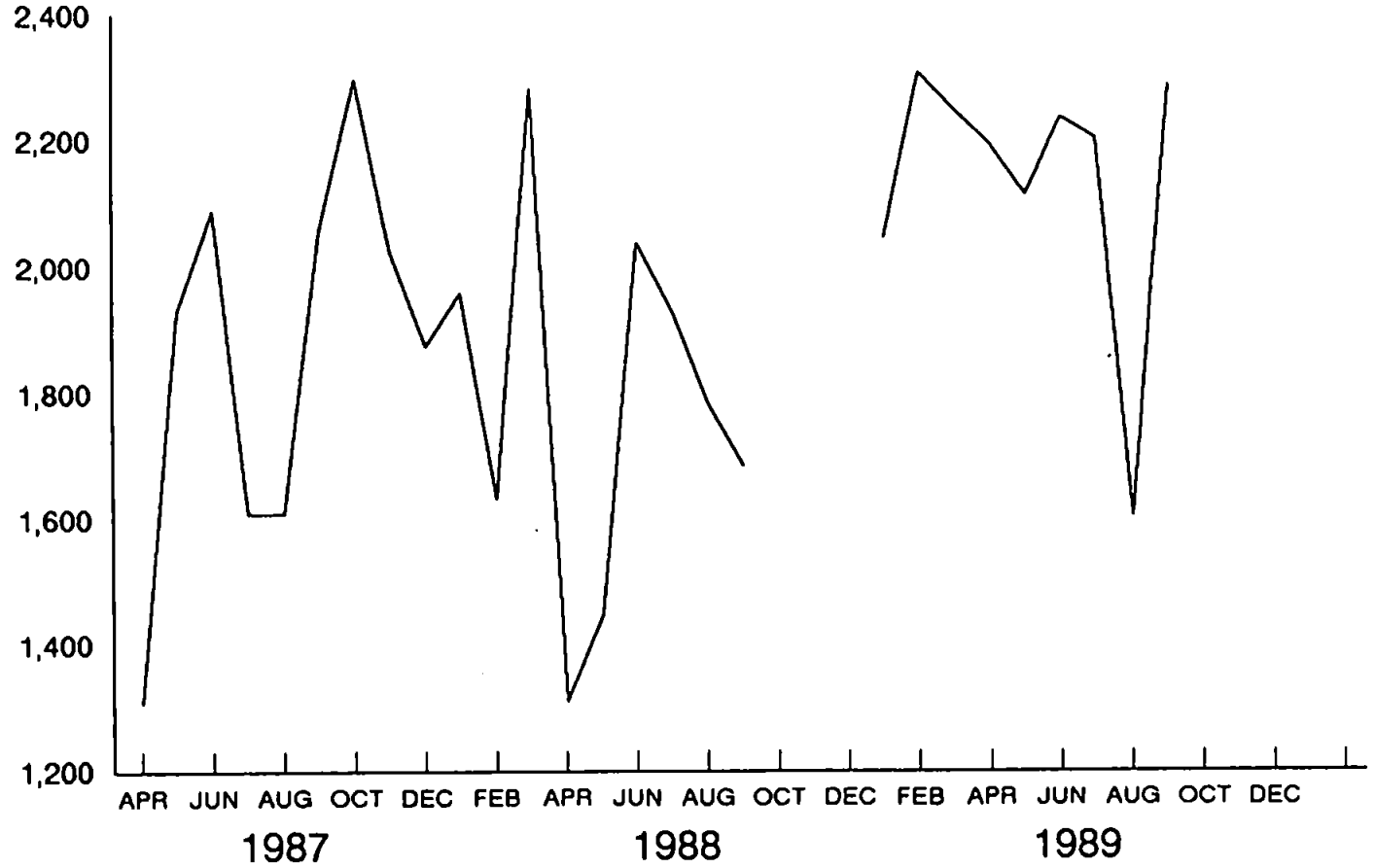
Figure 2.10: Commercial vehicle carryings on the Holyhead-DunLaoghaire route (Data not available from September to December, 1988)
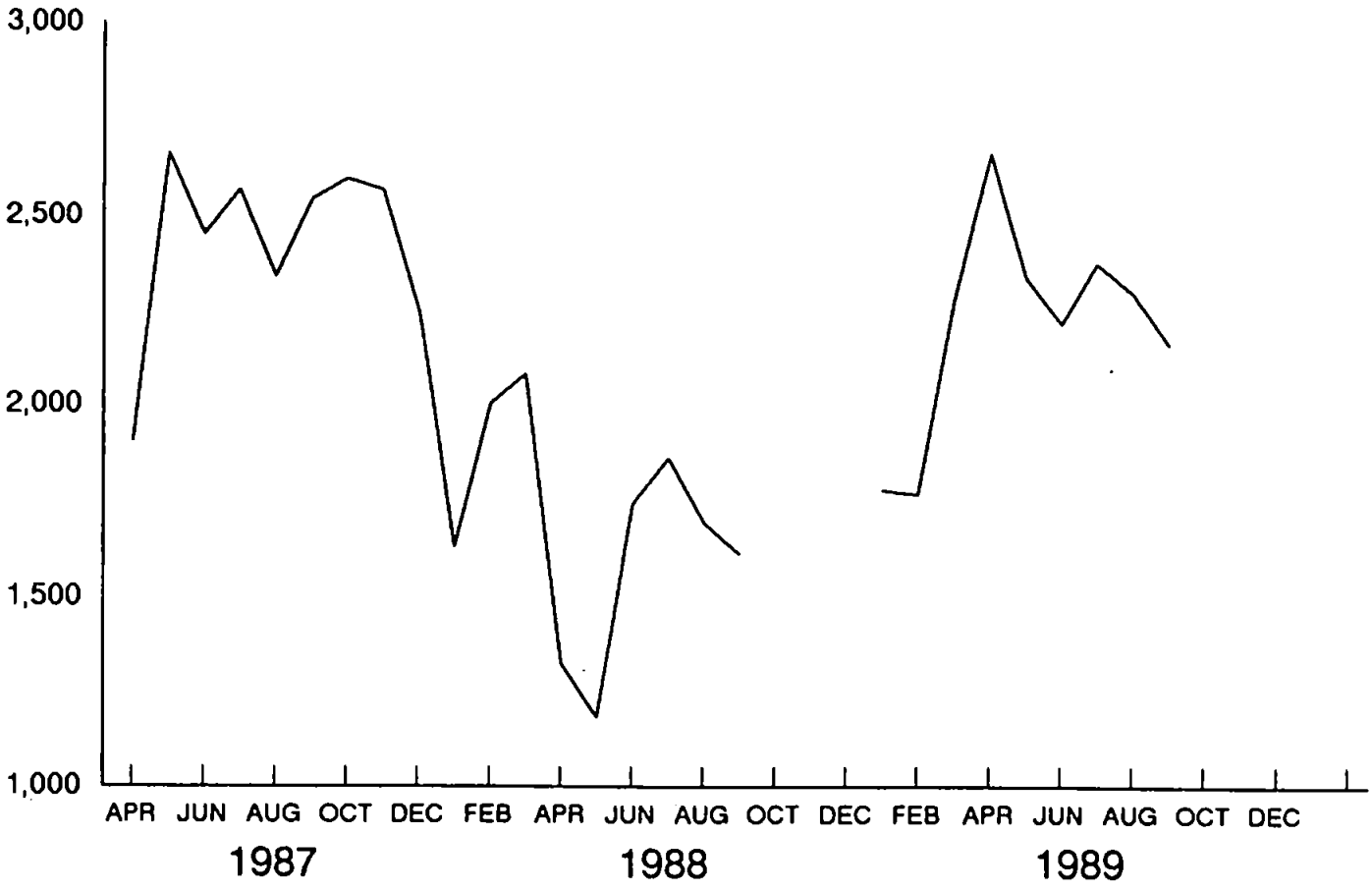
Figure 2.11: Commercial vehicle carryings on the Fishguard-Rosslare route (Data not available from September to December, 1988)

Table 2.1: Quantification of the Irish sea market (Source: CSO, NITB, UK Unitized Trade Statistics, NIDED, Port Statistics)

Market	Eire	N. Ireland	Ireland
Passengers (000)	2628	1593	4221
Ro-ro (units)	150339	337540	487879

2.3 Summary of the market

In 1986, the Irish sea market could be broadly quantified as in table 2.1.

This bald statment of figures tells next to nothing of the behaviour of the market. What it does indicate is that The Republic of Ireland is more important in terms of passenger traffic but that Northern Ireland is predominant in terms of trailer or ro-ro trade.

The dominant characteristics of The Irish sea market which have been identified, are seasonality and imbalance. Seasonality is particularly pertinent to the passenger market. A high preponderance of passengers visiting friends and relatives is a secondary characteristic of this market. The imbalance in the freight market is its dominant characteristic and stems from the manufacturing weakness identified in both Irish economies.

While seasonality and imbalance dominate the market, its small size allows it to respond very quickly to short term fluctuations in the exogenous conditions. The characteristics exhibited in the market are not restricted to the sea passenger market or the Irish sea unitized freight market. The air passenger market also exhibits seasonality and total Irish foreign trade, imbalance.

Chapter 3

Market segmentation: a literature review

The concept of market segmentation, first proposed by Smith (1956) has attracted a vast amount interest from both academics and practitioners. In 1978 Wind commented:

> In recent years one can hardly find an issue of any of the leading marketing journals which does not include at least one article directly concerned with segmentation...

The purpose of this review is to show how the concept of segmentation developed, its scope, and how segmentation may be applied to the Irish sea passenger and freight transport market. The review is structured as follows:

- **The segmentation concept**

- **Consumer and Industrial segmentation**

- **Segmentation in services**

- **Segmentation in transport**

- **Segmentation applied to the short-sea ferry industry**

3.1 Market segmentation

3.1.1 The segmentation concept

The environment in which Smith (1956) developed the concept of segmentation was one where supply exceeded demand. Consumers for the first time had a certain level of discretionary income, for a product to be different was not enough to ensure its sale (Myers and Tauber, 1977), and the customer was the focus of the firms' attention. In the 1960's this resulted in suggestions that marketing was *the* business philosophy (Myers and Tauber, 1977). Smith (1956) cites several reasons which contributed to the acceptance of market segmentation as a strategy:

- release from constraints of mass production,

- pressure to reduce marketing costs requiring improved matching of demand and product,

- the general rise in consumer prosperity, and

- the position of economic importance of product competition.

Twedt (1986) also gives several other reasons which have influenced the development of market segmentation:

- changes in income distribution,

- proliferation of consumer choice,

- effect of education,

- geographic variation in income level, and

- consumers coming to anticipate change.

This anticipation of and willingness to accept change is a key factor in the proliferation of goods and services.

Market segmentation is overt recognition that customers within the market for a given product are not homogeneous. The concept is underlain by three basic premises:

1. Customers are different,

2. Differences in customers relate to differences in demand, and

3. Segments of customers can be isolated within the overall market (Engel *et al.*, 1972).

The theoretical basis for segmentation is found in the monopolists' price discrimination model. Numerous and diverse factors produce heterogeneity in any market. Segmentation allows recognition of the existence of multiple demand curves which result from a heterogeneous demand where previously only one demand curve was recognised. This heterogeneity of demand is viewed as an opportunity by the market-orientated company (Frank *et al.*, 1972).

The term 'market segmentation' was originally taken to mean:

> ... groups of customers, homogeneous in some respect(s), who would respond differently to a particular marketing mix than other segments or the market in general (Myers and Tauber, 1977).

Smith (1956) defines market segmentation as:

> ... adjustment of product and marketing effort to differences in consumer or user requirements...

Over time the term has been widely used. The equation of market segmentation strategy with the act of sub-dividing the market has led to some confusion (Clayclamp and Massey, 1968). Dickson and Ginter (1987) have

criticised the literature for lack of precision in the use of the term 'market segmentation'. They feel market segmentation is a strategy in its recognition of multiple demand curves or, it is a form of research analysis concerned with the allocation of resources among segments which are assumed to exist. In the latter case, market segmentation is felt to be a way of viewing the market as a precursor to a segmentation strategy. Lilien and Kotler (1983) suggest the term 'market segmentation' has two inter-related components, one theoretical, the other strategic. The strategic definition involves resource allocation among segments and the theoretical definition involves the development of tools to identify and characterise the response function of different segments.

A pragmatic view of segmentation then is that it is the construction of groups of customers (segments) who will respond in the same way to the marketing activities of the firm. This response will guide marketing resource allocation between segments.

The changing views of segmentation reflect the development of the concept. As Smith (1978) later notes:

> Whereas segmentation's initial contribution to marketing planning was predominantly that of providing a framework for the analysis of existing data, its utility has now expanded so as to provide a basis for identifying the data needed for strategy selection and implementation.

Market segmentation enjoys a high profile in contemporary marketing. It has been placed at:

> ...the heart of modern marketing...(Baker, 1987)

and at:

> ...the centre of a firms business strategy...(Harvey, 1982 in Morden, 1984).

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Wind (1978) comments that segmentation has become a dominant concept in marketing and that it is:

> ...one of the major ways of operationalising the marketing concept ... [and] ... provides guidelines for a firms marketing strategy and resource allocation...

The task of a market segmentation strategy is to solve the fundamental problem of resource allocation in a heterogeneous market (Frank *et al.*, 1972).

The segmentation concept has been widely accepted by marketing management. It has been used to answer a variety of questions concerned with the responses of segments to strategic marketing plans (Lilien and Kotler, 1983). A survey by McCann (1973) suggested that segmenting the market is the most important problem facing marketing executives. A segmentation model is developed to explore solutions to management problems.

3.1.2   The segmentation model

A segmentation model consists of a dependent variable which is the basis on which the market is divided and independent descriptor variables to identify and define the segments. There are any number of ways to segment a given market with no way being 'best'. Traditionally segmentation has been divided between *a priori* and *post hoc* approaches. In a *post hoc* aproach the segments are not determined until the data has been collected. Yankelovich (1964) suggests that the cardinal rule of segmentation is never to assume in advance that the best way to segment the market is known.

Frank *et al.* (1972) suggest four criteria for evaluating alternative segmentation bases:

1. The variable should divide a market into homogeneous segments that tend to respond differently to promotional activities. This requires the establishment of relationships;

(a) Between the base and the descriptors, and

(b) Between the variables and the performance of marketing inputs.

2. Variables should be measureable.

3. Variables should be accessible through the firms promotional activities.

4. Variables should lead to increased profitability from segmentation.

This fourth criterion is the premise behind the practical undertaking of a segmentation approach. In addition to these criteria, the choice of segmentation base should also be related to strategy considerations (Green, 1977).

The selection of variables to act as descriptors for the segments is more complex. The problem of defining segments is immense (Bass *et al.*, 1968) and is probably the most heavily researched aspect of market segmentation. The major difficulty is understanding of the relationship between the base and the descriptors. Price elasticity of demand for a particular product may be the only factor on which a group of customers is homogeneous. It may be impossible to identify them by their demographic or socio-economic characteristics or reach them through a single means of promotion. Although much research has concentrated on segmenting particular markets and establishing a valid relationship between the base and the descriptors, the results tend to be specific to that market. An exception to this inability to generalise results may be the work of Lesser and Hughes (1986) which suggests that psychographic segments may be generaliseable between geographic locations.

Once segments have been developed it should be ascertained that they satisfy criteria for usefulness suggested by Kotler (1986). In addition to being homogeneous, segments should also be accessible, measureable, sustainable and actionable. Thomas (1980) adds the fifth criterion of stability. Farley *et al.*, (1987) suggest that segment stability should be a key concern for managers. Arndt (1974) suggests the criteria of size, intensity of needs and

wants, relative strength to competitors and compatibility of segments may be helpful in deciding on which segments to concentrate.

3.1.3 Uses and benefits of segmentation

Engel *et al.*, (1972) list several advantages accruing from a segmentation approach:

1. It gives a more precise definition of the market in terms of customer needs. Understanding of these needs allows the development of a marketing programme to meet them.

2. Ongoing segmentation research will improve management capability to take advantage of changing demand.

3. It provides a means of assessing competition and thus some segments can be avoided and resources conserved or allocated more efficiently.

4. Segmentation leads to a more precise setting of targets.

Beik and Buzby (1973) also suggest that by using segmentation to analyse markets and choosing which segments to serve, the competitive position of the firm can be improved in the long run.

It should be noted that some instances exist where segmentation may not be useful. Young *et al.* (1978) suggest examples of markets for which segmentation is not an appropriate marketing strategy:

- The market is so small that marketing to only a portion of it would be unprofitable.

- When a few customers account for the majority of sales in the market they are the only relevant target.

- Where the brand in question is already dominant in the market it draws its sales from all segments and targetting at one or two segments would not benefit total sales.

Bonoma and Shapiro (1984) stress that segmentation is expensive and highlight two points to ensure that segmentation is cost effective:

1. How does the amount of segmentation affect the cost of segmentation (in terms of both direct and indirect costs).

2. How does the marketing mix, tailored for each segment, impact on the economics of the firms operation.

3.1.4   The academic/practitioner gap

Despite market segmentation being one of the most heavily researched fields in marketing (Wind, 1978), a gap exists between academics and practitioners of the subject. Baker (1985) suggests this gap is characterised by Wind's (1978) explanations why no consensus exists about which descriptor variables will help define segments:

- Lack of a systematic effort by both sides to construct a body of substantive findings about consumer behaviour.

- Lack of specific models linking behaviour to descriptors, which would predict which desriptor variables to use.

- The non-representative nature of many academic studies.

- Lack of comparable conceptual and operational definitions of variables across studies.

Cuba (1978) also cites two problems associated with segmentation which may contribute to the academic/practitioner gap:

1. No method exists for determining the optimum segmentation base.

2. A lack of evidence pointing to which segments may be more vulnerable (responsive) to a brand or company.

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A major barrier to the narrowing of the gap is the problem of implementation of segmentation studies. Implementation of such a study requires full management support (Engel *et al.*, 1972) and the effectiveness of the study is limited by the ability of management to implement strategic implications (Weinstein, 1987). According to Johnston (1972), managerial flexibility and an active marketing orientation will increase the effectiveness of a segmentation strategy.

3.1.5   Schools of segmentation research

Two schools of segmentation or research orientations have developed. The distinction between a behavioural orientation and a normative orientation, explained by Frank *et al.* (1972) has subsequently been used by Lilien and Kotler, 1983). The clearest exposition of the differences and similarities between the two schools is provided by Frank *et al.* (1972).

The behavioural school

Frank *et al.* (1972) characterise the behavioural school as:

> ... concerned with the identification and documentation of generalizable differences among consumer groups because these differences can lead to insights about basic processes of consumer behaviour.

The goal of the behavioural school is to add to the body of knowledge and theories of consumer behaviour. Thus, the main area of investigation is the relationship between customer characteristics and buying behaviour; both what is the relationship and in the long term, why does the relationship exist and ultimately how can it be used to predict the market.

The normative school

Whereas the behaviourally orientated school may initially query whether or not the market can actually be segmented, the normative, or decision-orientated approach, begins with the assumption that different segments do exist. It focuses on how differences between customers can be used to improve the efficiency of the firm. Market segmentation is seen as a two stage process:

1. How can customers be grouped into segments?

2. How should available resources be allocated between the segments.

It is not concerned with why differences exist between segments.

The normative approach to segmentation has a firm micro-economic basis in the literature on price discrimination. Some of the less desirable aspects of monopolistic price discrimination do not apply to market segmentation. For example, economic theory shows that when marginal costs of production and selling are equal, charging different costs to different customers leads to an overall loss of social welfare, this however is not necessarily so in market segmentation. Price discrimination however, is only a small part of market segmentation (Frank et al., 1972).

Smith's concept of segmentation is disaggregative in its recognition of multiple demand curves in a single market. The normative model of segmentation, developed by Clayclamp and Massey (1968), suggests however that segmentation should be seen as a five stage aggregative process.

- **Stage 1 - Perfect segmentation** The first stage is known as perfect segmentation where each individual in the market is recognised to have an individual demand curve.

- **Stage 2 - Initial aggregation** The process of aggregation begins when the institutional constraints of marketing to individual customers

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are taken into account.

- **Stage 3 - Micro-segmentation** Micro-segmentation considers both institutional and information constraints. The micro-segments formed by this third stage are generally too small for practical use, but they can be defined using (media) descriptor variables.

- **Stage 4 - Macro-segmentation** Micro-segments are further aggregated into macro-segments.

- **Stage 5 - Complete aggregation** The fifth stage takes aggregation to the point where segments are no longer recognised to exist within the market.

According to Frank *et al.* (1972):

> The fundamental problem of market segmentation can be characterised as that of finding the point where marginal reduction in profits caused by the imposition of another constraint, or level of aggregation, is just balanced by the the marginal reduction in research and administration costs made possible by the constraint.

Frank *et al.* (1972) suggest that this point will most likely occur at the macro-segmentation stage.

The Clayclamp and Massey model has been expanded by Frank *et al.* (1972) and Mahajan and Jain (1978) have further developed the model to allow simultaneous construction of segments with resource allocation because, as they point out, it is meaningless to develop segments which cannot be served with existing resources. It should be noted however that these institutional constraints will change over time and may well be outside the control of the selling company.

Whether the approach is aggregative or disaggegative, the important point is that it is impossible to form meaningful segments without taking institutional and information constraints into account. It is the construction of

managerially useful segments, based on the relationship between customer characteristics and the response elasticities to inputs of the marketing mix of segments that is the province of the decision orientated school. Early work measuring group elasticities (Frank and Massey, 1965 & 1967) found no significant difference to exist between groups. Tollefson and Lessig (1978) contest whether elasticity is the ideal normative segmentation base and suggest its use should be examined closely.

Clayclamp and Massey's normative model has not been empirically tested (Lilien and Kotler, 1983). Empirical studies may be viewed from either orientation and the same study may be a success from one viewpoint but not the other (Frank *et al.*, 1972). Lilien and Kotler (1983) see the practical use of the normative model as one of the major challenges facing segmentation research. The majority of empirical research has contributed to the behavioural school but decision-orientated findings have also been made.

McCann (1973), for example, in an econometric analysis of differential responsiveness of market segments showed that differences in response rate do exist and these can be measured using readily available data such as buyer behaviour characteristics. Starr and Rubinson (1978), segmenting on a basis of brand loyalty in a consumer packaged goods market, obtained high correlations between loyalty group cross price elasticities and empirical observations of share, repeat rate and switching behaviour. Elrod and Winer (1982) found customer response to price to be superior, in terms of brand profits, to other segmentation bases. More recently, Krishnamurthi and Raj (1985) found that consumer price sensitivity decreased as a result of increased television advertising for an established brand.

Comparison of the behavioural and decision-orientated schools

Frank *et al.* (1972) summarise the differences between behaviourally orientated and decision orientated, or normative, segmentation research. The behavioural school:

- identifies and documents differences between customers and searches for predictors of difference,

- contributes to the theory of why differences occur.

The decision orientated school:

- assumes that differences do exist and focuses on how meaningful segments can be constructed,

- searches for predictors to construct segments,

- develops proceedures for allocating resources between segments.

The two orientations of segmentation research are not polemic. Both are concerned with the existence of group differences in consumption and the possibility of predicting such differences by means of customer characteristics (Frank *et al.*, 1972). The methodology does not differ fundamentally between the two schools and both have a contribution to make. Frank *et al.* (1972) suggest that researchers keep the two orientations in mind and state the objectives of their research.

3.2 Segmentation in consumer and industrial markets

Up to now little distinction has been made between types of customer i.e., either consumer or industrial. The material reviewed thus far has been drawn mostly from segmentation of consumer goods. The development and acceptance of the segmentation concept was fostered in the consumer goods market and later adopted by the industrial goods market. (Note that the emphasis is on goods products rather than service products.) Figure 3.1 illustrates how the segmentation concept has been applied in two directions:

- From consumer goods to industrial goods, and

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Type of market

Consumer   Industrial

Goods

Type of
Product
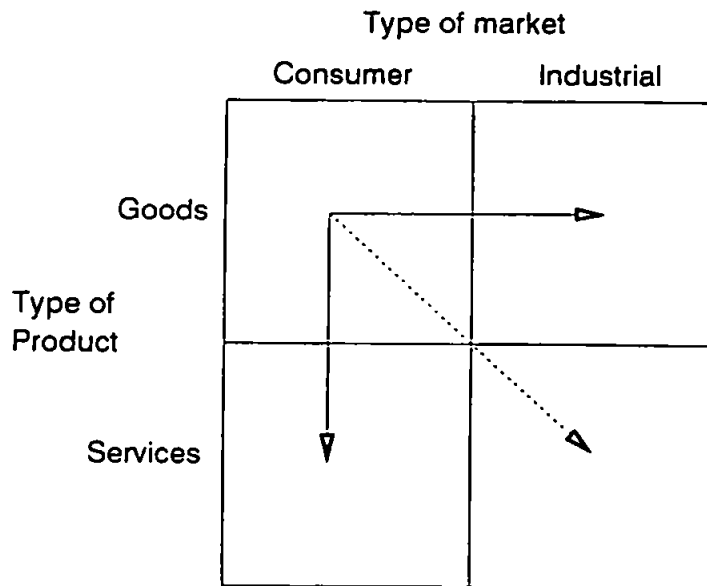
Services

Figure 3.1: Application of the segmentation concept to service and industrial markets

• From consumer goods to consumer services.

from its origin in the consumer goods market. This section considers the application of segmentation to industrial, or organisational, markets and section 3.3 considers segmentation in service markets. The lack of segmentation research in the industrial service market may be highlighted at this point.

Diversity of demand has long been accepted as a fact to be dealt with in industrial markets (Smith, 1956). The purpose behind segmentation is the same in both consumer and industrial markets (Cheron and Kleinschmidt, 1985). It is however easier to distinguish between industrial and consumer markets than between industrial and consumer products (Cardozo, 1986). An example of such a product is a pen or pencil. If bought solely for domestic or personal use it is a consumer product, but if it is bought as part of an office stationery requirement then it is an industrial product.

Frank *et al.* (1972) argue that since:

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> ...segmentation is a logical outgrowth of the marketing con-
> cept and of economic theory, it is at least as applicable (in in-
> dustrial marketing) as it is for the marketing of consumer goods
> in a domestic market.

They also suggest, as do Wind and Cardozo (1974), that conceptually the only difference between consumer and industrial segmentation is in the specific bases which are used for segmentation. Hlavacek and Ames (1986) contradict this, saying it is misleading to suggest that segmentation approaches work well in both consumer and industrial goods markets. Undoubtedly this is true for specific approaches but on a more general level there are probably more similarities than differences between the segmentation approaches utilised in both markets.

One area where differences are apparent is the marketing research necessary for segmentation (Kunstler, 1986). The major differences are firstly; the procedures and approaches used for data collection and secondly; the buying units in the industrial market vary enormously in size, power and structure, making the identification of the decision maker complicated. This is in contrast to the consumer market where the buying unit -the family- does not exhibit so much variation. Twedt (1986) suggests another important difference. The demand for industrial goods is usually a derived demand which tends to be relatively inelastic. The demand for industrial goods tends to fluctuate more widely than the demand for consumer goods. Segmentation bases in the consumer market are considered in section 3.2.1. Segmentation in industrial markets in considered in section 3.2.2 and bases in the industrial market is section 3.2.3.

3.2.1 Segmentation bases in consumer goods markets

Major reviews of segmentation bases are found in Beane and Ennis (1986), Weinstein (1987) and Frank *et al.* (1972). Segmentation bases may be grouped into five main categories

1. Geographic, demographic and socio-economic characteristics,

2. Personality and life-style characteristics,

3. Situation specific characteristics such as product useage patterns and attitudes,

4. Benefits required by users,

5. Response to marketing variables.

Geographic, demographic and socio-economic characteristics

The general customer characteristics of geographics, demographics and socio-economics, grouped as physical attributes by Weinstein (1987) are the most popular bases for market segmentation (Lilien and Kotler, 1983). Bessom and Jackson (1975) comment that geographic segmentation is a necessary aspect of planning for most companies as resource constraints prevent them serving all needs in diverse and scattered segments. Demographic characteristics also found early appeal in segmentation, due to their ease of measurement, their accessibility and relatively large size of segments (Frank *et al.*, 1972). Other advantages of physical attribute characteristics are their relatively low cost and the possibility of using the data in more than one market (Weinstein, 1987). Engel *et al.* (1972) suggest that the primary usefulness of geographic, demographic and socio-economic characteristics is in the selection of mass communications media.

Much criticism has been levelled at the physical attribute characteristics. Yankelovich (1964), in a study of ten highly varied markets (three of which were industrial), concluded that demographic and socio-economic characteristics were unlikely to provide the direction for marketing strategy required by management. Plummer (1974) has commented that demographic characteristics lack 'richness' and may need to be supplemented with other data and Frank (1968) concluded that these characteristics contributed little to the understanding of variations in purchase behaviour. Also Bass *et al.*

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(1968) noted that socio-economic characteristics of customers were unable to explain a substantial part of variance in the usage rate of grocery products.

Personality and Life-style characteristics (Psychographics)

Personality and life-style characteristics may be combined under the heading of psychographics (Weinstein, 1987). Strictly, life-style segmentation is concerned with the activities, interests and opinions of customers while;

> ...psychographic segmentation combines demographic data about customers with information about their psychological profiles or types (Thomas, 1980).

Psychographic segmentation is often called life-style segmentation (Beane and Ennis, 1987). Wells (1975) provides a major review of psychographics.

> [The] basic premise of life-style research is that the more you know and understand about your customers, the more effectively you can communicate and market to them (Plummer, 1974).

It provides a broad, everyday view of consumers and helps explain the 'why' behind purchase.

Data collection for psychographic segmentation is more complex, with a greater reliability being placed on primary sources. Plummer (1974) notes that psychological characteristics may lack reliability when they are expanded from the sample and the findings may be difficult to implement. Frank et al. (1972) also comment on the implementation of findings, saying:

> The lack of a theory of life-style...has detracted from the operational usefulness of this concept.

This sentiment is also felt by Roberts and Docker (1986), who say of life-style segmentation:

> ... after arousing initial interest, the life-style approach never seemed to establish itself... it faded away.

They ascribe this decline to life-style segmentation proving to be useful on too few occasions.

Situation specific characteristics - Product usage patterns and attitudes

The most commonly used aspect of product usage patterns is the usage rate which divides customers into light, medium and heavy users of a product (Twedt, 1964). It is popular as the data provided by market research agencies can be used by several firms. A further advantage is that it is a highly flexible form of segmentation. Weinstein (1987) however, notes that product usage segmentation does not have the widespread acceptance of demographics, nor does it share the explanatory power of psychographics or benefit segmentation.

A major problem exists in segmentation involving attitudes towards the product:

> ... which came first - the product or the attitude? (Frank *et al.*, 1972).

Benefit Segmentation

Benefit segmentation, developed by Haley (1968) was one of the first attempts to describe the relationship of customers with the product (Myers and Tauber, (1977). Haley (1968) contends:

The belief underlying this segmentation strategy is that the benefits which people are seeking in consuming a given product are the basic reasons for the existence of true market segments.

According to Beane and Ennis (1987):

The aim of benefit segmentation is to determine why a person buys a product and, therefore, why similar people might buy the product if the benefit is communicated to them.

Benefit segmentation should:

- determine the benefits people look for in a product,

- determine the kinds of people looking for each benefit, and,

- compare the proximity of existing products to benefit needs.

Each segment is identified by the benefits it is seeking. Myers and Tauber (1977) descibe this as 'benefit structure analysis' where needs and deficiencies are considered simultaneously to identify opportunities for improving products or introducing new ones. Some of the advantages of benefit segmentation are its high degree of flexibility (it can be applied in both consumer and industrial markets) and its emphasis on causal rather than descriptive factors (Weinstein, 1987).

Response to marketing variables

This type of segmentation attempts to discover the elasticity of demand of groups of customers. Frank and Massey (1975) contend that a crucial criterion for segmenting a market is whether the segments have different elasticities of demand in response to pricing and promotional policies of the firm (Lilien and Kotler, 1983). This is the essence of the normative school of segmentation. The use of response elasticity as a segmentation base has many complexities and difficulties (Assael, 1976).

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3.2.2 Approaches to industrial segmentation

Plank (1985) provides a general classification for industrial segmentation approaches depending on how the segmentation base is selected:

- Unordered base selection. The majority of empirical industrial segmentation research falls into this category and is largely similar to the approaches found in segmentation in the consumer market.

- Two step base selection, and

- Multi-step base selection.

The two step base selection approach, which is hierarchial in nature, was proposed by Frank *et al.* (1972) and further developed by Wind and Cardozo (1974). A two step approach is also advocated by Webster and Wind (1972). The first step acts as a broad sceening of suitability, identifies 'macro-segments' within the market. Macro-segments are based on organisational characteristics. If all buying organisations in the same macro-segment have the same responsibility structure they are assumed to respond in a similar way to marketing stimulii (Lilien and Kotler, 1983). Macro-segment descriptors should be based on easily understood and distinguishable characteristics (Krapfel and Brannigan-Smith, 1985). The second step involves further segmenting relevent macro-segments into 'micro-segments', based on decision making unit (DMU) characteristics.

Choffray and Lilien (1978) performed a viable industrial micro-segmentation using procedures more commonly found in consumer segmentation approach. The micro-segmentation approach has four steps:

1. Measuring DMU composition, using the Choffray and Lilien decision matrix.

2. Defining a similarity measure across firms, a choice of indices of similarity/dissimilarity exists for this purpose.

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3. Segmenting firms into micro-segments, using cluster analysis.

4. Characterising the micro-segments, using multiple discriminant analysis.

More recently Wilson (1986) carried out a successful and cost effective macro-segmentation of the US metal working market with a view to guiding resource allocation according to the expected response of macro-segments to marketing efforts. However, he suggests that the results are not likely to be generaliseable to other markets. Other empirical macro-segmentation work includes Assael (1976) in the AT&T studies.

Bonoma and Shapiro's (1983) nested approach to base selection (see figure 3.2) is more than an extension of the two step approach. It differs conceptually in that it is non-hierarchial but recommends that the search for a segmentation base should begin with the outer nests and work inwards, stopping as soon as a useful base is found. This provides the segmentation effort with "sequence as well as sense". It is not necessary to investigate every level and irrelevent nests may be ignored. The outer nests are more general and data is more easily obtainable. Bases should be chosen from the outer nests where possible as they are easier to work with. The inner nests contain more situation specific variables which are more powerful and more useful but the necessary data is not readily available and they are likely to be difficult to use. The innermost nest but one 'situational factors' has been virtually neglected in practice but is thought by the authors to hold a great deal of potential in finding a useful segmentation base. In evaluating their approach Bonoma and Shapiro state:

> Perhaps the strongest advantage of the nested approach to segmentation is that it encourages clear and meticulous thinking by naming and ordering the various bases that managers can use to think about their markets.

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┌─────────────────────────────────────────────────┐
│                 Demographics                     │
│  ┌───────────────────────────────────────────┐  │
│  │             Operating variables            │  │
│  │  ┌─────────────────────────────────────┐  │  │
│  │  │         Purchasing approach          │  │  │
│  │  │  ┌───────────────────────────────┐  │  │  │
│  │  │  │      Situational factors       │  │  │  │
│  │  │  │  ┌─────────────────────────┐  │  │  │  │
│  │  │  │  │        Personal          │  │  │  │  │
│  │  │  │  │     characteristics      │  │  │  │  │
│  │  │  │  └─────────────────────────┘  │  │  │  │
│  │  │  └───────────────────────────────┘  │  │  │
│  │  └─────────────────────────────────────┘  │  │
│  └───────────────────────────────────────────┘  │
└─────────────────────────────────────────────────┘
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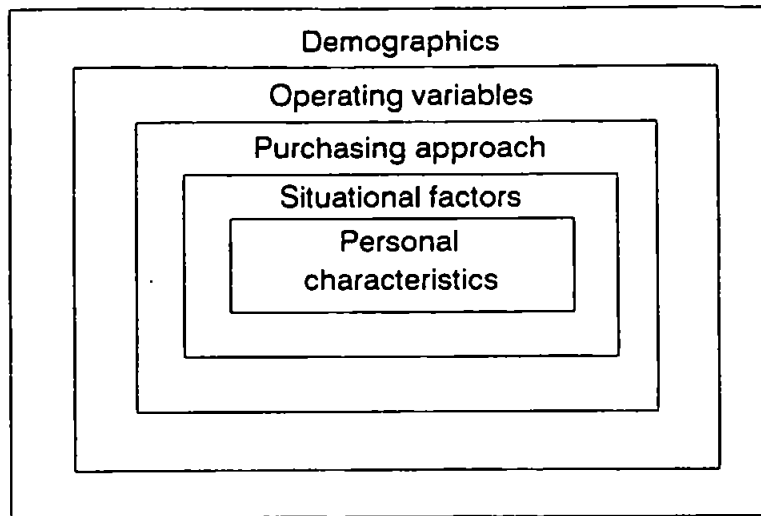
Figure 3.2: Bonoma and Shapiro's nested approach to base selection

Although Bonoma and Shapiro (1983) provide arguably the most comprehensive study of industrial market segmentation to date, Hlavacek and Reddy (1986) do not consider the contribution to be great when considered in terms of operational relevence.

In a later publication Bonoma and Shapiro (1984) differentiate between two more general approaches to industrial market segmentation:

1. Segmentation based upon customer need. This is similar to benefit segmentation, aggregative in nature and may be extremely difficult to implement. Theoretically this is the preferable approach.

2. The major characteristic of the second approach is ease of implementation. It is disaggregative in nature and based on prospective segment identifiability and accessibility. Buyer characteristics are assumed to be associated with an underlying need but no definite causal relationship between buyer characteristics and benefits sought can be claimed.

Hlavacek and Ames (1986) put forward another hierarchial approach to industrial segmentation. The market is initially divided into original equipment manufacturers (OEM's) and aftermarket users. Further division by Standard Industrial Classification (SIC) then occurs and the next sequential step is application. The first two steps must always be present. They can then be followed and combined with common buying factors, geography or buyer size.

Cheron and Kleinschmidt (1985) also propose a two step segmentation approach. The initial step in this approach is to group buying units with similar influence structures. This is followed by searching for a descriptive variable which can be used to identify groups with different influence structures. The groups can then be accessed and targetted by the selling company.

3.2.3 Bases for industrial market segmentation

Some categories of bases for industrial market segmentation have already been mentioned in the preceding section. The two main categories of bases for industrial segmentation are:

1. organisational characteristics,

2. characteristics of the DMU.

A comprehensive discussion of general and situation specific organisational and DMU characteristics is found in Frank *et al.* (1972) and Bonoma and Shapiro (1983) provide a chapter on each of their nests of possible bases. Further categories include characteristics of individual transactions, the purchase situation (Cardozo, 1986), product characteristics (Cheron and Kleinschmidt, 1985), characteristics of the personel involved and occasionally characteristics of the selling firm (Parasuraman, 1980).

According to Frank *et al.* (1972), the relevence of the base depends on:

Table 3.1: Segmentation variables in industrial segmentation. Source:
Cheron and Kleinschmidt, 1985

Characteristics	Significant variables
Organisational	Industry type, size and degree of centralisation
Buying group	Composition, buying situation
Personal/Individual	Education, perceived risk.

- the type of product under consideration,

- the objectives and constraints of the firm,

- potential segment sizes,

- ease of measureability,

- accessibilty and,

- the cost of reaching segments.

Certain variables have been more closely examined than others (Cheron and
Kleinschmidt, 1985). Table 3.1 shows variables which have been found to
be significant in at least three studies.

Cheron and Kleinschmidt also evaluated some of the categories of bases
in terms of appropriateness and the difficulties which they posed to users.
They concluded that while organisational characteristics had a low level of
user difficulty, their appropriateness could only be set at a medium level. In
contrast DMU characteristics have a high level of appropriateness but also a
high degree of user difficulty and product characteristics have low appopri-
ateness in addition to a medium degree of user difficulty. Obviously this
does not give much help to practitioners in their search for a segmentation
base.

Benefit segmentation in industrial markets

Benefit segmentation has been applied to industrial market segmentation with varying results and conclusions. De Kluyver and Whitlark (1986) found benefit segmentation to be conceptually well suited to their study and distinguish between benefits sought and benefits deliverable. Moriarty and Reibstein (1986) also found benefit segmentation to be conceptually well suited to the industrial market. They attempted to determine whether traditional bases which were more familiar to practitioners could act as surrogates to form quasi-benefit segments.

The use of surrogate variables was intended to circumnavigate the two main problems responsible for the lack of practical acceptance of benefit segmentation in the industrial market:

1. The data required for benefit segmentation is not straightforward and is relatively expensive to collect.

2. Identification and accessibility of benefit segments is more complex than for segments derived from traditional bases.

Also benefit segments cannot be predetermined on an *a priori* basis. Moriarty and Reibstein (1986) concluded that traditional bases did not act as surrogates and until surrogates could be found, benefit segmentation was unlikely to attain widespread acceptance in industrial market segmentation.

Hlavacek and Ames (1986) comment:

> The identification and selection of market segments is the most important strategic decision facing the industrial firm.

Yet despite the importance of segmentation, its use is nowhere near as widespread or effective as it could be (Wind and Cardozo, 1974) and little implementation has been reported. Bonoma and Shapiro (1983) criticise

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both academics and practitioners; academics for neglecting industrial segmentation and practitioners for not filling the void left by academics. They repeatedly call for a better approach to industrial market segmentation.

A review by Hlavacek and Reddy (1986) criticises academic industrial market segmentation for using literature from industrial buying behaviour to explain segmentation and feel the grouping of customers with similar needs has been neglected. Although the relationship between industrial buying behaviour and benefits sought is questioned, the study of the buying unit may however represent an opportunity to integrate consumer and industrial market segmentation (Cheron and Kleinschmidt, 1985).

3.3   Segmentation in the service industries

Much marketing debate has been concerned with the relationship between goods and services and the question whether strategies developed in one area can be applied to the other (see for example; Cowell, 1984; Shostack, 1977; and Gaedeke and Tootelian, 1983). As the majority of marketing research, especially segmentation, has been conducted in the consumer goods market the direction of application has been from goods to services. More recently however, lessons learnt in the service sector are finding relevence in the goods sector. Blois (1983) comments that it may be unhelpful to concentrate on the differences between goods and services if wider issues such as what needs the product (either a goods product or a service product) is fulfilling are ignored. Twedt (1986) observes:

> Markets for services are subject to segmentation in the same
> way as markets for consumer and industrial goods.

Although no functional differences exist between goods and service segmentation, certain features of services (intangibility, for example) lead to some

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aspects assuming greater prominence. One instance of this is that perceived risk is a more important basis for segmentation in the service sector (Guseman and Hatfield, 1978), particuarly in consumer services. Much of the relatively high level of perceived risk stems from consumers feeling that they have less information about services than goods (Davis *et al.*, 1979; Weinberger and Brown, 1977). Heskett (1986) identifies other sources of perceived risk:

- the non standard nature of many services,

- a lack of evaluative criteria and,

- absence of, or difficulties of obtaining guarantees against poor performance.

The simultaneous nature of production and consumption is a further feature of service products which has implications for a segmentation strategy (Heskett, 1986). For certain services, tourism or holidays provide a good example, it is important that segments are compatible with one another. 'Club 18-30' and 'Saga' holidays are unlikely to exhibit this compatibility.

In the previous section the different treatment of segmentation for consumer and industrial goods was apparent. The same level of distinction does not appear in the literature when looking at consumer and industrial services and Jackson and Cooper (1988) note that greater delineation exists between consumer goods and services than between industrial goods and services. Industrial services in general and their treatment in segmentation have been largely neglected. Possible reasons for this neglect may include the 'expertise' of industrial customers and greater difficulty in obtaining data. The relative lack of attention does not persist when the focus is turned to segmentation in the transportation services, which is discussed in section 3.4.

3.3.1 Applications of segmentation in services

The penetration of segmentation has not been as great as in the goods field but the range of applications has been extremely diverse and includes for instance Banks (Weinstein, 1987), legal services (Humphreys, 1982) and even US Naval recruitment (Bayus *et al.*, 1987) and telecommunications (Assael, 1976; Assael and Roscoe, 1976; Assael and Ellis, 1976). Two areas which have received more attention are tourism and the hotel industry. As travel forms an integral part of the tourism experience findings in tourism may be pertinent to segmentation in travel. The hotel industry has certain characteristics, in particular the fact that it serves both personal and business customers, which may also provide some lessons for the transport industry.

3.3.2 Segmentation in tourism

As travel and transport has a close relation to and forms part of the whole tourist experience it is possible that findings and techniques or methodologies will be pertinent to the later discussion of segmentation in transport. Tourism has received much attention in the published service segmentation research area. Not surprisingly much of this tourism research is sponsored by or associated with government departments. The majority of the literature concerning the uses of segmentation in tourism tends to be largely concerned with the personal holidaymaker. It does not include aspects of tourism such as conference delegates being given a tour of the surrounding area as delegates will have a different reason for visiting the area.

Early segmentation research in the tourism field tends to be concerned with the general tourist and have a normative orientation. This is illustrated in the studies by Woodside and Motes (1981), Crask (1981) and Woodside and Pitts (1976). Woodside and Pitts (1976) found lifestyle to discriminate well between segments. Woodside and Motes (1981) compare the demographic, socio-economic, life-style and magazine readership characteristics

of five tourist segments found in South Carolina. This knowledge of segment characteristics is used to develop a media strategy whereby different segments are targetted using different advertisements in different magazines. The advertisements can be tailored to appeal to particular segments.

Crask (1981) is also concerned with developing a differentiated media strategy. He makes use of pyschographics to develop five segments based on vacation preferences:

1. the rest and relaxation vacationer,

2. the sightseer,

3. the cost conscious

4. attraction orientated vacationer, and

5. the sports enthusiast and the camper.

These segments were found to differ in their demographic and socio-economic profiles; for example, the rest and relaxation vacationer tended to be a middle aged couple with no youger children at home, have a higher income and a college education; while the camper segment tended to be composed of predominantly younger couples who were likely to have young children and a lower income. The five segments were also found to differ with respect to their magazine readership patterns. As with the previous example it is this last point which is important as it allows the different segments to be reached by different advertisements, thus satisfying the accessibility criterion required by Kotler. It is worth reiterating the point that it is meaningless to develop segments within a market if the segments cannot be treated in different ways.

In contrast, the later tourism segmentation studies tend to concentrate on more specific cases, such as the reasons why tourists visit a particular country. Consequently these studies have a more behavioural orientation although they are used to guide marketing strategy formulation.

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Benefit segmentation has been successfully employed in the tourist market. Woodside and Jacobs (1985) discovered that different nationalities realised different benefits from visiting Hawaii. Appreciation of these different benefits may be useful for planning and positioning promotional messages to appeal to the different national segments.

Henshall *et al.* (1985) is not strictly a segmentation study although it does define a particular segment. They were concerned with why the Australian fly-drive market preferred Tasmania to New Zealand as a holiday destination. The fly-drive segment profile is described as mostly husband and wife couples who are away for seven to fifteen days and tend to book less than one month in advance.

Another application of segmentation in tourism is provided by McQueen and Miller (1985). Fifteen segmentation bases are compared on the grounds of profitability, accessibility and variability between the profiles of resultant segments. It was concluded that the best (most useful) segmentation was provided by a combination of two bases, the type of accommodation the tourist stays in and whether the tourist had visited the country (Tasmania) before. This resulted in four segments:

1. the first time holidaymaker (stays in a hotel or guest house),

2. the repeat holidaymaker,

3. the first time guest (stays with relatives/friends),

4. the repeat guest.

The repeat guest segment has the highest number of repeat visitors and also the highest total expenditure. The managerial (or government policy) implications of this study are that differential strategies for the four segments could increase the overall number of first time and repeat tourists visiting Tasmania.

Schewe and Calatone (1978) segmented the Massachussetts tourism market

in three hierarchial stages using pyschographic and demographic charac-
teristics. The pyschographic segments were developed using a battery of
Likert-type statements. The findings are applied directly to recommenda-
tions for advertising strategy and copy. The first stage segments the tourist
market by season and year, the second segmentation is by primary purpose
of visit (business, visiting friends and relatives or recreation) and the third
stage further segments the recreation group on the basis of type of desti-
nation, either mountains, ocean, or city. Segments were found to be stable
over time at the first stage. The second stage showed the business, visiting
friends and relatives and recreation segments to have distinct pyschographic
profiles although some similarity did exist between the visiting friends and
relatives and recreation profiles. A strategic advertising implication of this
is that messages targetted at the recreation segment, who are the most
likely group to be influenced by advertising, will also 'hit' some part of the
visiting friends and relatives segment and therefore the message must also
appeal to the visiting friends and relatives segment. Further segmentation
of the recreation segment resulted in small segments. These segments were
too specific to be useful. Any advertisement meant to influence these small
groups would also be read (or seen) by other potential visitors to whom it
may have less appeal.

The segmentation studies discussed thus far are concerned with tourists
not resident in the study area. Woodside *et al.* (1980) however develop a
pyschographic and demographic profile of the within state tourist in South
Carolina. As the name suggests, this is a tourist ordinarily resident in the
state. Again this research is concerned with determining the pyschographic
profile in order that more sucessful advertising messages can be developed.

3.3.3   Segmentation in the hotel industry

Another area, where segmentation has been applied is the hotel industry.
When considering segmentation in this industry the concept of segment

mobility becomes important. Segment mobility allows for the fact that a customer may be a member of a particular segment at a particular time, but at another time or while engaged in a different activity, the same customer may be a member of another segment (Heskett, 1987). For example, a person may stay at the same hotel when travelling for business and personal reasons.

The two main types of customer (business and non-business or leisure) and the concept of segment mobility mean that it has become common practice for the hotel industry to serve both the consumer (leisure) and industrial (business) markets at the same time. This practice is known as *dual* marketing (Quelch, 1987) and is widespread throughout the service industries, including transport operations such as airlines and ferry shipping.

Hall (1986) suggests that a combination of increasing competition and little overall market growth has prompted the modern hotel industry to adopt segmentation. The segmentation bases employed have been largely concerned with price and customer type. Hall (1986) feels that most hotels recognise (although they may not cater for all of them) three price segments, expensive, medium priced and relatively cheap; and two customer segments, business and leisure. The leisure/business distinction is also employed widely in transport segmentation.

The key concepts discussed in the tourism literature which may be applied to segmentation in transport are as follows:

- the division of the market into business and leisure (non-business) customers

- the concept of 'dual' marketing

- the concept of segment mobility.

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3.4 Segmentation in transport

The concept of segmentation has been applied to the (passenger) transport industry since the mid 1970's. The two main areas of application have been urban transport or transit and air transport. The emphasis has been largely on the passenger market but this includes elements of both the consumer (those travelling for personal reasons) and the industrial (those travelling for reasons associated with business) markets. The consumer/industrial distinction is much less obvious or rigid than when it was introduced and segment mobility is much more apparent.

3.4.1 Urban transport or transit

An early use of segmentation within the urban environment is Reed's (1974) consideration of segmentation as a strategy for bus transportation. He suggests that the segment which buses serve has little potential for growth as it is primarily composed of low income customers and that the bus service may itself be an inferior good with a negative income elasticity of demand. Reed (1974) suggests a possible solution to this problem would be to attract higher income segments and for this new innovative services are needed. He speculates about specific services which may appeal to highly specific segments. Many of the suggestions are likely to be operationally impracticable. Although Reed (1974) identifies a bus using segment there is little evidence in his work of a formal analytical segmentation approach. He makes little use of the classic segmentation literature available at this time.

In contrast, the study by Nicolaidis *et al.* (1977) is obviously a formal segmentation. It is based on data collected in a metropolitan area of Ottowa, Canada and consists mainly of trips to work. Six alternative segmentation bases are evaluated as to their suitability for use in transportation planning. In addition to Kotler's criteria for segments, Nicolaidis *et al.* (1977) suggest that segments to be used in transportation planning should exhibit two

further characteristics:

1. a relation to travel behaviour,

2. a relation to planning of service options.

This latter characteristic refers to the usage of particular services by customers with different socio-economic characteristics. A base which defines customer groups compatible with service options is more useful than a base which does not.

The six bases studied consist of two demographic bases, one multi-dimensional and one on a single criterion, language; two travel choice constraint bases, again one multi-dimensional and the other on the single base of car ownership; and two attitudinal bases, one on general attributes and the other on attitude importances. No one base was superior to all the others, suggesting the different segmentation bases may be useful for different purposes. The choice constraint bases performed as well as or better than the other bases on most of the evaluative criteria and have advantages in their ease of measurement and statistical robustness over the attitudinal bases. They are also the most easily interpreted for travel behaviour. Although the attitudinal bases would appear to be useful for the planning of service options, they were difficult to measure and lacked statistical robustness. Nicolaidis *et al.* (1977) query whether the six bases merely represent six ways of dividing the market or whether membership of a particular segment using one base can be used to predict segment membership when a different segmentation base is used. Overall little relationship exists between the bases.

Another relatively early application of segmentation is Hensher's (1976) study of shopping trips (including mode choice) in Sydney, Australia. The basis of this paper lies in transport geography rather than marketing, yet Hensher (1976) does acknowledge and distinguish between the behavioural and normative schools of segmentation research. He provides a good discussion of the problems associated with choice of the segmentation variable

and the effects of interaction between variables. Segmentation is used as an alternative to defining travel zones.

Robinson (1981) asks why the principle of market segmentation has had such an impact in transit research? The recognition that customers may be responsive to different services or to different appeals is used to maintain the present level of useage and also increase the number of people using urban passenger transport by:

- Identifying specific segments and,

- Developing marketing programs to suit segments with the greatest growth potential.

With little mention of *why* certain services are chosen in preference to another, this work adheres to the normative school of segmentation research because it concentrates on with identifying segments and allocating resources between them. Robinson suggests three key uses for segmentation in urban passenger transport:

1. Improvement of demand forecasting by developing separate models for separate segments.

2. Design and marketing of urban passenger services.

3. Transit policy analysis, the identification of segments that support or oppose transit policies.

Higgins (1984) reports on a specific segmentation study by the San Diego transit authority to identify the best segments to target for conversion to public transport. Gensch (1981) is also concerned with the use of segmentation in developing marketing strategies which will encourage car owners either to share rides (more people in the car) or convert to public transport. The likelihood of a car owner switching between car and bus use appears to be related to demographic characteristics but a broad conclusion is that

individuals who do not perceive much difference in the satisfaction levels between car and bus travel are more likely to switch. This study is part of a US government goal to increase ride sharing.

One of the most widely reported British studies of segmentation in the urban environment is by Bamford *et al.* (1984, 1985 and 1987). Initially (1984) the suggestion is made that public transport policies have traditionally been supply or product orientated. The public transport policies of the West Yorkshire Passenger Transport Executive are examined in relation to a segmentation of the market (1985). Finally association analysis, a technique developed in plant ecology, is used to define ten segments with respect to four variables; trip purpose, household car availability, economic activity and sex of the trip maker. The technique of association analysis is capable of defining distinctive segments without requiring 'a priori' specification of the dependent variable but it does incorporate a certain degree of subjectivity into the segment definition.

Trotter (1985) focuses on price discrimination rather than market segmentation in his study of British Rail's passenger market. He notes however that several features of a service, particularly temporality and non-transferability do help in the segmentation of the market and concludes that the price charged is inversely related to the price elasticity of the segment. This relationship is also observed in the later discussion of air transport.

Segmentation has also found applications in the urban environment as part of wider studies not necessarily connected with marketing. It has proved to be highly useful for transport demand modelling in Maceio, Brazil where it was used to model the the varied social, cultural and economic environments found in this poor region (Swait *et al.*, 1984). Previously Brown (1982) used segmentation to reduce the predictive error in a gravity model. The reduction in predictive error suggested that a weakness of the gravity model is its uniform application across a population which may have widely differing distribution functions.

The preceding discussion indicates the emphasis on the passenger market in transport segmentation. Little distiction has been made between personal and business travel (this use of words rather than consumer and industrial is more appropriate in the context of segmenation in transport). However some attention has been given to segmentation of freight transport services.

British Road Services are one freight transport company to recognise that different customers have different needs (Price, 1984). Five need segments are identified and each is approached differently with its own sales force. The stimulus for the segmentation approach appears again to come from a lack of market growth and a corresponding increase in competition. Other studies concerned with freight transport which are aligned to, but are not strictly, segmentation include Cunningham and Kettlewood (1976) who concentrate on buyer behaviour and McGinnis (1980) who criticises the lack of research in exploring more fully the need for these services.

3.4.2   Air transport segmentation

The other area of transport which has made extensive use of the segmentation concept is the air industry. Again the emphasis is on the passenger market. The distinction between the business and the personal/leisure (non-business) traveller is much more apparent. Increasing capacity and increasing competition, particularly that encouraged by deregulation of the airline industry in the USA, has led to many airlines adopting a policy of market segmentation in the attempt to achieve better use of their service (Vambrey, 1976).

A relatively early application of segmentation to air transport considered the use of segmentation to improve the overall profitability of the airline (Vambrey, 1976), one of the basic premises of a segmentation policy. Vambrey (1976) divides the market into two main segments based on their response to price and other service features. The two main segments are:

1. **The schedule and convenience sensitive segment.** This segment is composed of passengers who are primarily interested in:

   - flight frequency,

   - schedule convenience, and

   - ready seat availability.

   Price is relatively unimportant and consequently relative price inelasticity is a characteristic of this segment.

2. **The price sensitive segment.** This segment is composed of passengers who choose between air services primarily on the basis of price and may therefore be willing to accept a less convenient schedule. (The idea of trade-offs between price and convenience is developed further by Robinson and Wind, 1978.) This segment tends to be much more price elastic.

The two segments are not completely distinct from one another. They are related by the relative importance of price and convenience. The first segment will have some price elasticity while the second will have some schedule selection constraints but they do have distinctive behaviours. Other than price sensitivity or convenience sensitivity, Vambrey (1976) does not provide any other means, such as demographics, of identifying the two segments.

A more extensive discussion of the general segments present in the passenger air transport market is found in Shaw (1985). Shaw explains segmentation as a classification process and defines segments in terms of size, product requirement (need satisfaction) and willingness to pay (price elasticity). The most important basis for segmentation is likely to be purpose of journey, either business or leisure. Leisure may be further segmented into holiday or visiting friends and relatives (VFR). These sub-divisions are also found in short-sea ferry markets. Shaw suggests that further segmentation of the air market by length of haul may be useful as long and short haul passengers will have different product needs with respect to:

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- flight frequency,

- flight timing, and

- in-flight service.

The major demographic, socio-economic and need requirement characteristics of the business and leisure segments are discussed, contrasted and compared.

The business segment would appear to correspond to Vambrey's convenience sensitive segment as it is relatively price inelastic (although this will not necessarily hold if there is a high level of competition in the market). Service characteristics, such as:

- comfort,

- the level of in-flight service,

- seat availability, and

- flexible ticketing

are important to the business segment. Differences exist between the short and long haul business travellers with flight frequency being important for short haul with lower comfort and in-flight requirements while for the long haul business traveller, in-flight service and comfort are more important. The business market tends to have a fairly narrow age range, between thirty and fifty years old, and be predominantly male. However this predominence is decreasing rapidly and Chambers *et al.* (1982) provide a pyschographic profile of the female air traveller.

In contrast, the leisure segment has a different demographic and socio-economic structure. The demographic structure shows a wider age range with a tendency for the trip rate to increase as wages and salaries increase, and a much more balanced sex distribution with, perhaps, a slight preponderence of females. This leisure segment would appear to be comparable

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with Vambrey's price sensitive segment as price is an important determinant of service choice and both price elasticity and income elasticity are characteristics of this segment. The leisure market also differs from the business market in terms of its journey characteristics which has implications for the service provided. The average length of stay is longer in the leisure market and therefore flight frequencies are less important. The leisure market is more flexible with respect to the timing of the flight and the longer advance booking period of the leisure market means that the operator does not need to offer seat availability near to the departure time.

Shaw suggests that a third smaller, but distinct, segment also exists, the personal travel segment. This is composed of people travelling in their own time and paying their own fare but who have greater restrictions in the timing, frequency and routing of flights than the leisure traveller.

Another more general study of the air passenger market (Bruning *et al.*, 1985) uses environmental, demographic and personality factors to indicate why a particular service is chosen. Four types of airline exist in the USA:

1. the major carriers such as TWA and PANAM,

2. the national carriers such as Air Florida,

3. regional carriers, and

4. commuter carriers.

The latter two types have largely emerged since deregulation and have entered into competition with major and national carriers on short to medium haul routes. Regional carriers are, in general, newly certificated airlines serving small and medium city pairs while commuter airlines are non-certificated companies providing a regular scheduled service with sixty, or fewer, seats. Bruning *et al.* found that the major and national carriers did not differ significantly and neither were there significant differences between the regional and commuter carriers. Three environmental variables:

1. convenience,

2. economy, and

3. safety

and one psychological variable:

- lifestyle

were identified as being important in the choice of type of carrier. Of these variables, convenience was the most influential. These results suggest that convenience, economy, safety and lifestyle may be important variables in segmenting airline markets.

So far segmentation in air transport has been discussed at a general level. Before considering specific airline segmentation strategies the use of segmentation in fare plans will be explored. A fare plan is conceptually similar to an *attribute bundle*. Farris and Harding (1976) suggest that passenger transport services may be understood to be a 'bundle of attributes'. This concept allows for the case that a passenger does not select a service on the basis of only 1 aspect of the service, for example, frequency; but on several aspects or attributes of the service, for example, frequency, price and in-flight service.

Robinson and Wind (1978) in a survey conducted for the International Air Transport Association (IATA) discovered that people from different countries were similar in their evaluation of fare plans. The managerial requirements of IATA led to three different groups being studied:

1. those who had flown across the North Atlantic before,

2. those who had flown before but not across the North Atlantic and,

3. those who had never flown before.

The second group was found to consist of three distinct segments:

1. a price sensitive segment,

2. an anti-group flight segment and,

3. an anti-booking restriction segment.

The survey also identified discriminating demographic, life-style and flight experience characteristics of segments which could be used in promotion design. The discovery that the evaluation of fare plans (disutility avoidance) was common across countries may indicate that these results are capable of being generalised to a certain extent. The existence of a price sensitive segment is again consistent with Vambrey (1976).

Good *et al.* (1985) also discovered a price sensitive segment, composed of vacation travellers, when the Canadian air transport market was segmented on the basis of consumer's preferences for product attributes. Attributes considered were:

- price,

- airline,

- minimum stay requirement,

- advance booking requirement,

- departure frequency, and

- en route stops.

The other segment identified consisted of travellers who were more sensitive to the minimum stay requirement. These tended to be male business travellers. Good *et al.* (1985) suggest that the negative feeling of businessmen towards the minimum stay requirement and also booking restrictions may separate the business and leisure segments. This could enable the airline to cater to each segment more effectively as business travellers would be unable to take advantage of special offers in the leisure segment and vice versa.

The fare plan which achieves market separation with the fewest restrictions is the preferable management choice.

Ritchie *et al.* (1980) also considered the restrictions in fare plans and found that business and vacation segments would accept different restrictions. The vacation segment felt the fare was highly important relative to the perceived disutilities of the most severe travel restrictions. This segment was willing to accept restictions such as no stopover, minimum and maximum stay requirements and advance booking and payment requirements but not any uncertainty associated with the reservation. The vacation segment was also unwilling to accept restrictions concerning the time of week of the flight or cancellation penalties. The business segment also showed less acceptance of restrictions on the timing of the flight although the time of day of the flight was also important here. Reservation restrictions and minimum stay requirements were also unpopular. However the business segment was more willing to accept a maximum stay limit, no stopover, cancellation penalties and, perhaps surprisingly, advance reservation restrictions.

Scandinavian airlines have utilised the idea of fare plans, with an emphasis on passenger need, to determine the type of aircraft which would be more suitable to its major target, the business segment (Carlzon, 1987). Two types of aircraft, the Airbus and the DC9 were considered. Despite the fact that the Airbus was newer and could offer a higher degree of comfort, the older DC9 could operate more frequent and direct flights. Thus the service provided by the DC9 was more suited to the business segment for whom flight frequency is important.

Morden (1985) notes that Cathay Pacific, which also concentrates on the business market, segments on the basis of user characteristics. The business segment requires fast journey times and a reasonable level of comfort. However, to support the high frequency of services also required by the business segment, it is necessary to cater to another segment, low fare mass tourism. The net result is that 30% of seats are sold at high prices to the business

segment, providing 40% of the revenue while the remaining 70% of seats are sold at lower fares to the price sensitive tourist segment.

A report of Quantas' marketing strategy (Hollett, 1985) does not actually mention segmentation but divides the market into six categories, each with a distinct psychographic profile. Methods of reaching the different categories are not discussed.

The air freight market

Despite the fact that it is common practice, especially on long haul routes, for wide bodied aircraft to carry both passengers and freight, little mention has been made of segmentation within the freight market. Shaw (1985) identifies several contrasting features between the freight and passenger markets. The freight market:

- often exhibits a (pronounced) directional imbalance,

- is highly heterogeneous,

- is highly concentrated, and

- both long and short haul routes have to compete with surface modes of freight transport.

Although no commonly agreed segmentation of the air freight market exists, Shaw identifies three major general segments based on their price elasticities:

1. emergency traffic

2. routine perishable traffic

3. routine non-perishable traffic.

The emergency traffic where transit speed is of primary importance is likely to be highly price inelastic. Price elasticity increases for the other two seg-

ments and cross price elasticities become more important and are significant for routine non perishable traffic.

3.5 Segmentation applied to the short-sea ferry market

The preceding discussion of segmentation in transport has not mentioned the shipping industry. Although much academic theory and many models of segmentation have been developed since 1956, there has been very little application of the theory and models to the shipping industry. This concluding section briefly reiterates the main concepts of segmentation and discusses them in the context of the short-sea ferry industry.

3.5.1 The segmentation concept

The key concept of segmentation is that the buyers of a product, in this case a short-sea ferry service, are not homogeneous. They do not all exhibit the same demographic characteristics, their socio-economic and psychographic characteristics will differ and they may purchase the service for different reasons, in which case their expectations and requirements of the service will differ.

The normative school of segmentation assumes that different segments in the market will respond differently to the marketing activities of the firm. Some segments may be relatively inelastic to a change in price while another may respond in a highly favourable way to an increase in advertising in particular journals. The strategic objective of segmentation is to use the response of the segments to guide resource allocation. This school assumes that each individual customer has a demand curve. Similar curves are then amalgamated until groups, segments, of customers with similar curves are large enough to merit separate marketing consideration.

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3.5.2 The short-sea ferry market

The market is examined in greater detail in chapter 2 and only the main points are summarised here. The major division in customers using the ferry service is between passenger traffic and freight traffic. The short-sea ferry industry caters for both the consumer and industrial markets. Rich (1980) has considered the desirability of the present practice carrying both freight and passengers in the same vessel. He suggests that the carriage of passengers and freight has many complementary aspects, particularly freight providing a year round service to counteract the highly seasonal passenger traffic. However, under certain circumstances freight and passenger traffic may detract from one another. The example Rich uses is that the sight of a cattle truck parked beside a motorist's car is not attractive to the motorist on holiday and treating the ferry crossing as a 'mini cruise'.

The passenger and freight markets will have different requirements of the ferry service. Passengers are likely to need more seating accommodation and catering facilities. Usually only a relatively small number of freight drivers travel with a vehicle. Within the freight and passenger markets there will be smaller groups of customers each with their particular needs. Parties of holiday makers travelling with their car may have different requirements for on board facilities and other aspects of the service depending, for example, on whether or not young children are included in the holiday party, how much money is available for the trip and many other factors. The ferry operator should be aware of the requirements of to the different groups when considering service design and promotion strategy. The segmentation analysis in this work will identify the service requirements of segments.

Relevance of other industries

The examination of certain other related industries, tourism, hotel, urban transport and air transport, may provide guidelines as to what variables

may be useful descriptors, leading to possible areas to explore in a survey. Also approaches and methodologies used in a related area may be useful. The relevance of tourism segmentation studies to the passenger market is discussed in section 3.3.2.

Exploration of segmentation in the hotel industry highlights the concept of segment mobility. This concept recognises that individuals may belong to different segments at different times or while engaged in different activities. Segment membership and structure is also likely to change over time. Segment mobility may be more relevant to the transport industry as a whole but also has applications in the short-sea ferry market. A possible instance is a holiday maker who uses the service twice in a year, the first time as part of a holiday package tour and the second on an individually planned journey. It is important to recognise that the impressions and experiences gained on the first use of the service will influence the purchase of the service for the second journey.

The idea of dual marketing, resulting from catering for both the passenger and freight markets, is also found in the hotel industry. One advantage of dual marketing to the hotel industry is that it serves a broader range of customers, ie., it can address both the business and the leisure markets, thus reducing its dependency on a particular market. It is almost a necessity for the ferry industry to employ dual marketing to reduce its dependence on a highly seasonal passenger market. It is the patronage of the freight market which allows the service to run on a year round basis, although the frequency of sailings may be reduced during the non-holiday season. As the freight market provides the backbone to many services it is important that it is not antagonised by preferential booking for cars during the holiday season.

The area which has greatest similarities with the short-sea ferry service is the airline industry. The most relevant similarity is the simultaneous carriage of passengers and freight in both industries. However, the airline

passenger market is likely to have a greater business component than would be found in the ferry market. One reason for this may be the 'value' of the business man's time. A basic economic principle is that all actions and decisions have an opportunity cost. If a business man in Belfast decides to visit a client in Manchester, the opportunity cost of his travel time is the revenue he could have earned for the company had he stayed at his desk. As the travel time by air is less than by sea it follows that the opportunity cost of travelling by air is the lesser and so the business man elects to fly. However, it should be noted that value of time is not the isolated reason for the decision. Factors such as convenience, the impression to be given, status and the money available are also important.

Discussion of segmentation in the air market highlights the 'purpose of travel' distinction within the passenger market. Several studies, most notably Shaw (1985), have considered the response function of 'purpose of travel' segments. Holiday segments are likely to be more elastic with respect to price and less elastic with respect to other service characteristics such as departure times. On the other hand, segments travelling for business purposes are likely to be highly elastic with respect to service characteristics, particularly departure and journey times, but exhibit less price elasticity.

A further point to emerge from this discussion is the idea that the customer may not purchase the service on the basis of only one of its characteristics, for example, price but on the relationship of price to other service characteristics, on board service and facilities, convenience, company reputation, etc.. These ideas are all directly applicable to the short-sea ferry market for both passenger and freight customers.

General segments (emergency, routine perishable and routine non-perishable traffics) were identified for the air freight market (Shaw, 1985) and it is possible that the approach, based on price elasticities, used to develop segments in the air market might also be employed in the ferry market. It is likely that the majority of ferry traffic will either be routine perishable or routine

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non-perishable, as due to its relative inelasticity to price, emergency traffic is unlikely to travel by ferry. In both the air and sea freight markets it should be recognised that the total cost of transporting the 'freight' from origin to destination is important, not just the cost, or journey time, of the ferry crossing.

3.5.3 The segmentation model

A segmentation approach should provide the ferry company with an improved knowledge of the market both in terms of customer needs and the likely response of groups of customers to a change in the marketing variables. This knowledge may be used to improve resource allocation and identify areas of the market either to concentrate on or avoid. Ongoing segmentation research should also improve management's ability to take advantage of changing demand and thus improve the strategic marketing decision making of the company. In applying this approach to the short-sea ferry market it is hoped that an integrated, passenger/freight market, approach to segmentation, where distinct markets are served, will be developed. The 'benefits sought' in the purchase of the ferry service may be used as a basis for segmentation in both the passenger and freight markets.

Differences may occur between the passenger and freight markets (the consumer and industrial parts of the market) in the marketing research required. In the consumer/passenger market the buying unit is unlikely to exhibit as much variation as the buying units found in the industrial/freight market. The majority of the buying units in the passenger market are likely to be family groups with two to three people having a role in the decision making process.

In the freight market however, it is likely that more personnel will participate in the process and their relationship to one another will be governed by their position within the company. As many more different types of firm, with respect to size and purpose, exist than do types of families it follows that

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many more different buying units will exist within the freight market. A transport manager, responsible for the purchase, may defer to the wishes of a senior manager who is less knowledgeable about available alternatives. The composition of the buying unit may also vary depending on the sort of purchase decision being made. If the purchase is simply a 'rebuy' of the previous purchase the decision is relatively straightforward and fewer personnel are likely to be involved. But if a service which the company has not used before is being purchased then the decision is more complex and is likely to have an imput from more people.

The accessibility of the decision maker will also vary. In the passenger market it seems likely that the person who decides to buy the ferry service is also the person who will experience the service and is therefore accessible through an on board survey. This may also be the case for a small number of owner/drivers in the freight market and again these buyers may be accessible in an on board survey, though possibly less so as drivers often use the ferry crossing as a rest period and some may choose to sleep. In the freight market however, most of the decisions to buy the ferry service are probably made by a transport manager (or buying unit) who is remote from and does not experience the service.

The service requirements of segments within the passenger and freight markets will be evaluated, as will the relationships of the various segments, within both parts of the market. The methodology developed should be applicable to any other industry which serves more than one distinct market with essentially the same service. The most obvious application is to the air industry but also to other services with combined passenger and freight flows.

Chapter 4

The development of the

Benefit Segmentation Model

The preceding two chapters have examined the passenger and freight market for Irish Sea transport services and reviewed the segmentation literature with the aim of applying it to a short-sea ferry operation. These two chapters form the basis of the theoretical model developed in this chapter. The conceptual model is presented in section 4.1.

4.1 The conceptual model

The conceptual model is presented in figure 4.1. The current operation of the ferry company is the result of the interaction of two sets of factors, those which are controlled by the company and those which are not. Factors which are not controlled by the company may be further divided into environmental characteristics, past market behaviour and the characteristics of both passenger and freight purchasers of the service. The company controlled factors are discussed using the marketing mix model (Borden, 1965). Alternatives to the segmentation approach are discussed. Segments

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resulting from the analysis are 'profiled' in terms of independent descriptive characteristics. Extensive comparisons are made between segments and this is the basis for the Benefit Segmentation Model (BSM). The BSM is concerned with using the knowledge gained through segmentation to optimise resource allocation, which will alter the marketing mix so as to become more attractive to passenger and freight users of the service. Other implications of the segmentation analysis have implications for new service development and the application of the methodology to other markets.

The components of the model are considered in detail in sections 4.1.1 to 4.1.9.

4.1.1 The external environment

The term 'environmental factors' encompasses all those factors which *may* in some way influence purchase of the ferry service. The array of possible factors is extensive and diverse, their influence may be either direct or indirect and it may or may not be measurable.

4.1.2 The Irish sea market

Chapter 2 has examined the market for Irish Sea transport services. The short-sea passenger and freight market served by Irish sea ferry services is a dual market. Two distinct markets, one consumer the other industrial are catered for by the one service. The consumer market is composed of passengers, either on foot or travelling with a vehicle wishing to cross the Irish sea for any reason while freight vehicles, possibly accompanied by a driver, make up the industrial market. The year-round freight traffic provides a steady revenue to counteract the highly seasonal revenue from passenger traffic. Carriage of freight vehicles also reduces daily imbalances in the traffic flows as car traffic tends to prefer a daylight crossing and freight an overnight one. Therefore this research encompasses both the passenger and freight
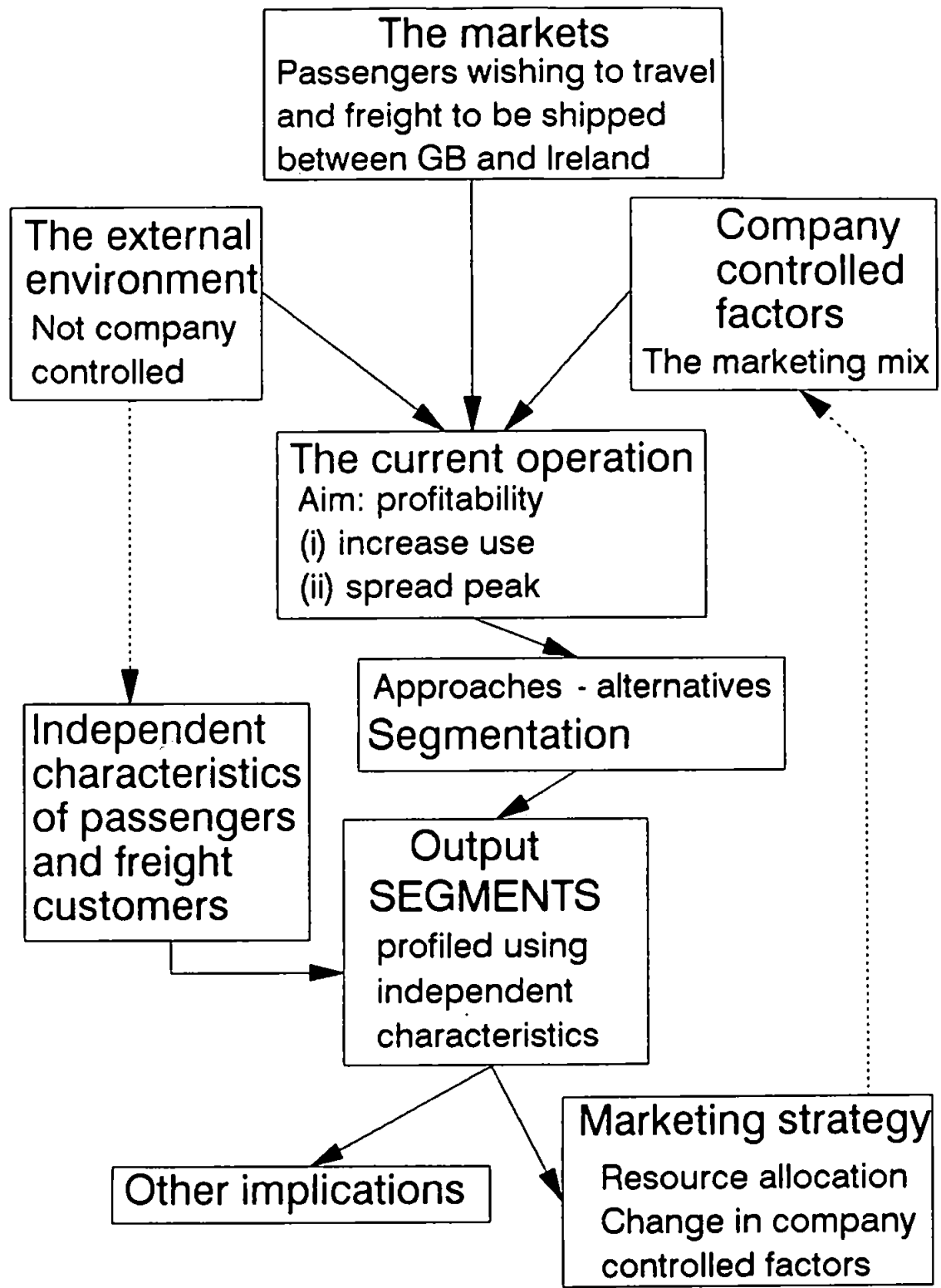
Figure 4.1: The conceptual model

markets. The freight market may be divided into principals or shippers and agents.

It emerged in chapter 2 that air has now achieved dominance over sea as the major carrier of passengers across the Irish sea and that ferry operators perceive airlines to be their major competitor. Two factors which have played a key role in air acheiving this dominance are:

1. The opening of Belfast City airport.

2. The introduction of low cost flights by independent operators.

Therefore, this research will also include the air passenger market with a view to comparing segments in the air and sea markets. More importantly, the research will also aim to identify segments (in both air and sea markets) which could be described as 'uncommitted' air or sea users, that is air, passengers who might be attracted to use a ferry service or ferry passengers who might use an air service.

4.1.3 Company controlled factors

The marketing mix model (Borden, 1965) is used to examine company controlled factors which influence purchase of the service. The marketing mix model can be applied to both the passenger and freight markets although the elements themselves will differ between the markets. Borden's original marketing mix model contains 4 elements:

- Product, or service

- Place

- Promotion

- Price

Cowell (1984) however, feels that the four 'P's marketing mix requires adaptation if it is to be sucessfully employed in the service industry and gives the following reasons:

- The mix was originally developed for manufacturing companies.

- There is some empirical evidence that the four 'P's are not inclusive enough for the service industry.

- There is also growing evidence that the dimensions in the marketing mix are not comprehensive enough for service marketing.

Booms and Bitner (1981) have expanded the marketing mix, alliteratively, to include:

- People,

- Physical evidence,

- Process.

The elements of the expanded marketing mix are discussed below.

Product or Service. It is important for the ferry operator to define the 'service product' being offered to the market. This will include information such as whether the service offered is door-door or quay-quay for the freight market; or for foot passengers whether the service purchased is for the ferry crossing only or includes a rail journey. The quality of the service and timing of the sailings also form part of the service being sold by the ferry company.

Place. It is difficult to separate place from product as the route is an integral part of the product. Place may be given separate attention if it is considered (in terms of distribution channels) to be the place where the service is purchased, in a travel agent, at an outlet of the ferry company or

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by phone. Ease of purchase factors, including accessibility and communication, now come into play. For example, if the road in which a travel agent marketing the service of a particular shipping company is difficult to find, sales will be lost.

Promotion. Promotion is the various means of communicating, not only with present customers, but also potential customers within the market. Promotional techniques include advertising, personal selling, sales promotions and also indirect forms of promotion such as 'word of mouth' advertising and recommendations of previous users of the service. The direct promotion, controlled by the shipping company is almost certainly, unless errors of judgement are made, going to be positive, in favour of the company. There is no guarantee that the indirect promotion, which is outside the control of the company, will also be positive.

Price. The interaction of price with quality of service and other elements of the service may be more important than price itself.

People. This element is particuarly important where there is a high level of contact between the service supplier and the customer, as in the service a passenger experiences on board a ferry. The importance of the people element in the marketing mix is highlighted by Carlzon (1990), President of SAS, who describes everytime a passenger comes in contact with an employee of the organisation as a 'moment of truth'. He estimates that SAS has fifty million moments of truth every year.

Physical Evidence. Physical evidence may be either 'essential' or 'peripheral'. Peripheral physical evidence is purchased as part of the service, for example a 'GB' car sticker. It has little or no independent value and merely serves to confirm or remind the customer of the service. Essential peripheral evidence, the more important of the two, cannot be possessed

and includes factors such as the interior decoration on board the ferry.

Process. Although the behaviour of the staff of the service organization is highly important, so is the actual working of the organization, the process. Polite, friendly and helpful staff cannot compensate entirely for a booking system that persistently double books or loses bookings altogether.

4.1.4 The Current operation

It has already been observed that that the short-sea multi-purpose ferry operator serves both the passenger and freight markets simultaneously, i.e., both passengers and freight are carried on the same sailing. This places the ferry operator in competition with not only other multi-purpose ferry operators (and of course the airlines), but also with dedicated freight only ferry operators.

The economics of ferry operations and competition between multi-purpose and freight only vessels are examined in detail by Garratt (1980). Multi-purpose vessels are the most capital intensive vessels on the Irish sea as accommodation and safety features increase the building cost. Multi-purpose vessels also tend to have a faster service speed. These increased costs exert a considerable influence to use the vessel intensively. The higher frequency of sailings generally offered by the multi-purpose operator are attractive to the haulier as well as the car driver. For the multi-purpose opertor to be able to compete for freight on a marginal cost basis they must (as Sealink Stena Line does) have a large share of the car and passenger market. The ability of the multi-purpose vessel to undercut the freight only vessel has limited the existence of the freight only vessel on the shortest routes. Multi-purpose vessels are an expensive way of carrying freight but flexibility and frequency of sailings means they can capture a wide range of traffics.

The current operation is the result of interaction between the environmen-

tal factors outside the control of the company and the company controlled factors of the marketing mix, i.e., between the customers and the service offering. It is assumed that the main goal of the current operation is to improve profitability. The company has two options to achieve increased profitability, it can either cut costs or increase revenue. Cost cutting is the more contentious option, it is likely to be opposed by unions who forsee job losses and may not be favoured by customers either as it may be perceived that a cut in costs will result in lower standards of service. So it appears that the preferable option is to increase revenue.

There are two aspects to increasing revenue:

1. increase use of the service and

2. spread the peak, particularly of passenger carryings and therefore reduce seasonality in overall revenue.

Increased use of the service may be achieved by attracting new custom, either from people who do not use a ferry service (possibly airline users) or people who are normally the customers of another operator, and/or encourage current customers to use the service more frequently. Factors which encourage more frequent use of the service by established and converted customers may also encourage use by new customers. The question is now 'how to achieve increased use and spread the peak of the service?'

4.1.5 Choice of strategy

The marketing strategy of a company is primarily determined by the market conditions (Dickson and Ginter, 1987). However, the choice of strategy can be broadly recognised as between:

- cost leadership

- product differentiation

- market segmentation

- positionning (Luck and Ferrell, 1985).

There is a great deal of published debate as to the merits, usefullness, applicability of and relationships between each of the strategies.

Briefly; cost leadership treats the market in an undifferentiated aggregative manner. The advantage of this approach is that it is relatively inexpensive in terms of time and advertising budgets.

Product differentiation attempts to provide the customer with a means of distinguishing between competing services. It is not necessary for the difference to be real so long as the customer perceives there to be a difference. This is difficult to achieve in the short-sea ferry market where perception already plays a major role in service choice.

The positioning approach concentrates on a particular part of the market. It tends to be more suitable for smaller operators.

The strategy of market segmentation divides the market, on a useful basis, into distinct subsets and then develops a different marketing mix for each of the segments which the company chooses to serve. This strategy should provide the most efficient allocation of marketing resources. This research adopts a segmentation approach.

4.1.6 Segments

The range of bases available for segmenting a market has been examined in chapter 3. The base chosen for use in this study is the benfits sought by the users of the service. Benefit segmentation has been selected for three reasons:

1. It provides good representation of the differences between customers (Haley, 1968).

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2. It may be used in both consumer and industrial (passenger and freight) markets (Frank *et al.*, 1972).

3. The emphasis placed by benefit segmentation on causal, rather than descriptive factors (Weinstein, 1987).

This third point is important when considering why certain groups of people (segments) purchase sea ferry rather than air services and *vice versa* and has fundamental implications for marketing strategy.

It is unlikely that customers (passenger or freight, sea or air) will choose a service on the basis of only one factor or attribute of the service but on the basis of several factors together, the benefits which the passenger or freight purchaser expects to realise from the purchase of the service. Therefore, benefit profiles will be constructed for customers in the passenger market and also for customers in the freight market. These benefit profiles will identify the relative importance of all the factors which the customer considers to be important in choosing the service. This gives rise to the basic hypothesis:

H_1: the service is selected not on the basis of a single feature, or aspect, but on the basis of a combination of aspects of the service.

Different combinations of aspects will be important for different groups of passengers or freight passengers. Benefit segments will be constructed by grouping customers together on the basis of similarity in their benefits sought profiles. Segments will be formed at the points where both similarities within a segment and differences between segments are maximised. This is the second hypothesis:

H_2: Benefit segments exist within the markets.

Benefit segments, therefore, consist of passenger and freight users of the

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service who hope to gain the same, or similar, pattern of benefits from the purchase of the service. Benefit segments will be constructed for passengers in both the sea and air markets and shippers and agents in the freight market.

4.1.7 Profiling segments

The construction of benefit segments is not sufficient to ensure their 'usefulness' for marketing management. On their own, benefit segments will not satisfy Kotler's criterion of accessibility. For segments to be accessible it must be possible for them to be identified in some other way. Therefore, benefit segments must be profiled in terms of independent characteristics. Profiling variables which differ significantly between segments will be identified.

Three sets of variables are used to profile benefit segments in the passenger markets:

- Travel behaviour,

- Buying behaviour, and

- Demographic and socio-economic characteristics.

Demographic and socio-economic variables provide perhaps the most widely used means of identifying and characterising consumer (ie passenger) segments. Description of the benefit segments developed in this study by means of these variables will allow comparison to be made with segments developed in other passenger transport segmentation studies. Different profiling variables are required in the freight markets. They may be broadly categorised as:

- Company operating characteristics,

- Present use of air and sea freight services,

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- Buying behaviour, and

- Company demographics.

This is the third hypothesis:

H_3: Segments can be idendified in terms of independent variables.

4.1.8   The Benefit Segmentation Model

The outcome of the segmentation analysis will be benefit segments, profiled in terms of independent variables, in the sea and air passenger markets and in the shipper and agent freight markets. These profiled benefit segments form the input to the BSM.

The benefit segments may be used to guide the marketing resource allocation of the company. For example:

- what service improvements/changes to make (the marketing mix)

- which segments to target

- how to reach different segments (media behaviour)

- the likely response of segments to changes in the marketing mix.

Marketing strategy stems from the resource allocation. It is a prescriptive model, suggesting guidelines for managers when a particular set of segments can be constructed from the market. Different segments, seeking different benefits, with different characteristics or profiles, would lead to a different resource allocation which would in turn guide a different marketing strategy. Segments will change with time.

4.1.9   Other implications

In the long term the resource allocation guidelines may have implications for new service design and development, for example, the provision of on board facilities and, potentially, vessel design. The approach should be relevent to any other industry catering for passenger and freight flows. The methodology may be applied to other markets with similar characteristics.

4.2   Summary of Part I

This introductory part of the thesis provides the background to the research. Chapter 2 has examined the operating environment for the short-sea ferry company and chapter 3 has discussed how the concept of market segmentation may be applied to the short-sea passenger and freight ferry market. This chapter has drawn these two areas together and proposes a model whereby benefit segmentation is applied to the Irish sea passenger and freight market. The opportunity to apply the model to the major competitor of the ferry service (the air industry) has been taken. Part II of the thesis is concerned with identifying and collecting data to conduct a benefit segmentation of the market for Irish sea passenger and freight, sea and air services.

Part II

Methodology

Chapter 5

Operationalising the model

The conceptual model developed in the previous chapter is operationalised in 4 stages:

- Identification of data required for construction and profiling of benefit segments,

- Collection of data,

- Preliminary analyses,

- Construction and profiling of benefit segments for input to the MSFM.

The first two stages are dealt with in this chapter and the methodologies for the latter two are presented in chapter 6.

The process of operationalisation is the same for the passenger and freight markets. At this operational stage however, it becomes appropriate to consider the passenger and freight markets independently. The stimulus for this division comes from the differing data requirements in the passenger and freight markets. Within the passenger market, sea and air passengers are considered independently, although as much similarity as possible is maintained. This is also the case in the freight market where shippers and agents
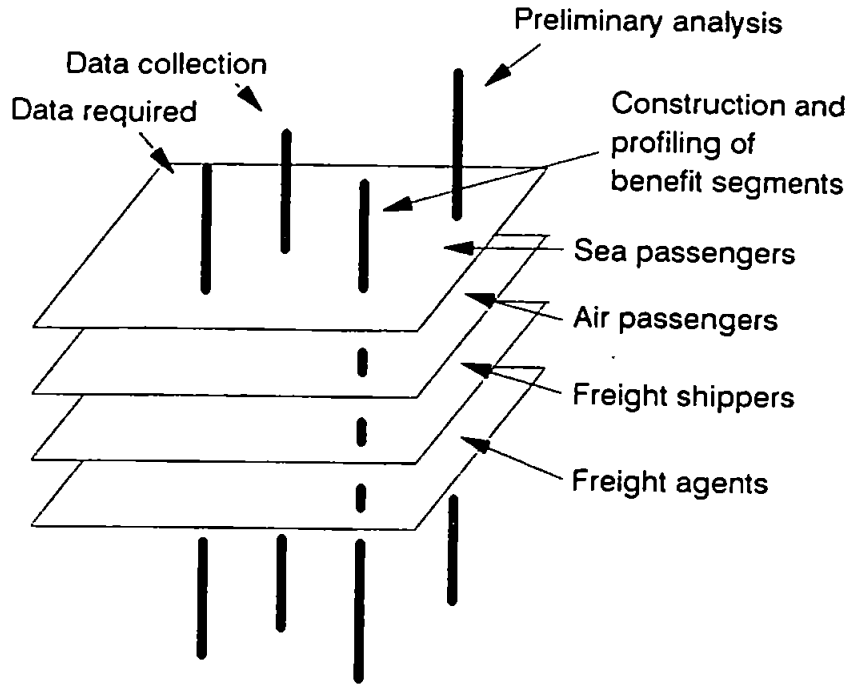
Figure 5.1: Common approach to four markets

are given independent attention. The common approach to four markets is illustrated in figure 5.1.

5.1 The sea passenger market

5.1.1 Data required

There are 2 aspects to the data required for the construction of segments:

1. The benefits sought by each segment.

2. Identification and access to these segments.

The data required in the sea passenger market is shown in figure 5.2.

SERVICE ATTRIBUTES

Convenience
Safety aspects
Ease of booking
Friendly attitude
Discount fare
Rail connections

Bus connections
Road connections
Baggage handling
Motorists lounge
On board service
Facilities for children

Facilities for
disabled persons
Cabin accommodation
Price
Decor
Travel time
Schedule

Profile of importance
placed on
service attributes

BENEFIT SEGMENTS

PROFILED USING

Travel behaviour

Journey purpose
Time spent away
Origin
Destination
Previous use
Car or foot passenger
Travelling with whom
Number in group

Buying behaviour

Find out
Where purchased
When purchased
Type of ticket
Any discounts
Cabin purchase

Demographics

Paper read
Age
Sex
Marital status
Area resident
Occupation
Spouse's occupation
Income
Education

Figure 5.2: Data required in the sea passenger market

Benefits Sought

The conceptual model suggests passengers select a service on the basis of benefts they hope to gain from the purchase. Benefits are derived from the attributes which the passenger perceives the service to possess. It is unlikley that a passenger will choose a service on the basis of only one attribute but on the basis of a combination of attributes and the relationships between them. The data required in the benefits sought box is a profile of the relative importance placed on various attributes of a particular service for each passenger.

Calantone *et al.* (1980) identify an initial step in the creation of benefit segments to be the development of a set of attributes. They recommend that this set should be as large as possible to include all attributes relating to the service. Studies in the air passenger market have identified price, convenience, restrictions with respect to length of stay, booking requirements, timing and frequency of departure, factors related to inflight service and safety aspects as being important service attributes in influencing service choice (Good, Wilson and MacWhirter, 1985; Bruning *et al.*, 1985; Ritchie *et al.*, 1980). Other important attributes suggested by Shaw (1985) include seat availability and length of journey, ease of booking, friendly attitude, good on board service and travel time. The importance of discount fares is examined by Toh and Hu (1988). Other aspects of the service are derived from the researcher travelling on the ferry service at an early stage of the research and consultation with Sealink personnel.

Data required for profiling benefit segments

Travel behaviour. Travel behaviour, in terms of who the passenger is travelling with, the transport mode by which the journey will be continued, and the length of the total journey will also influence the benefits sought or the relative importance of various attributes of the service. Shaw (1985)

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suggests that the purpose of the journey is often important in choice of service. A significant component of cross Irish Sea traffic is ethnic in origin (ie., visiting relatives). A 1988 survey (Bord Failte, 1988) of British based travellers to Ireland (excluding Northern Ireland) showed that 43% gave 'visiting friends and relatives' as their main reason for travelling to Ireland while only 18% gave 'holiday' as the main reason for travel . Past travel behaviour has been explored by Ronakainer and Woodside (1980) who particularly focus on repeat visitors to an area and discovered that repeat visitors were likely to have more than 1 reason for the visit. Woodside *et al.* (1987) have applied Twedt's (1964) heavy, medium and light user proposition to the passenger transport market.

Buying behaviour   Buying behaviour has implications for access to and communication with a segment. Access to a segment refers to the ability of the operator to communicate with members of a particular segment, as opposed to communicating with the market as a whole. The main area of implication of this selective communication will be the advertising strategy of the operator. This type of information may be found from the media behaviour and buying behaviour of segment members. The 'media behaviour' i.e., the newspapers and magazines read by segment members, may provide a suitable channel of communication. Crask (1981) found that groups with different vacation preferences exhibited different magazine readership tendencies. Television may also provide a means of communicating with select groups of passengers. The ITV station watched by passengers can be found from the geographical region in which a passenger is normally resident.

Buying behaviour, particularly where a passenger purchases their ticket and the length of time the ticket was booked in advance also has implications for advertising strategy, with respect to where and when to deploy advertising resources.

Demographic and socio-economic characteristics Woodside *et al.* (1987) suggest that education, occupation and income, in addition to media behaviour, may discriminate between benefit combinations sought. Demographic and socio-economic characteristics are discussed further with respect to their role in the identification and access of segments below. Several studies (Anderson and Langmeyer, 1982; Woodside and Pitts, 1976) have considered the effects of demographics, particularly age, on travel behaviour and Chambers *et al.* (1982) consider the difference between male and female travellers. Etzel *et al.* (1980) stress that it is important to look beyond demographics and caution that:

> Reliance on simple demographic features may lead a manager
> to overlook potentially important differences ...

5.1.2 Data collection

Survey Adminstration

For any survey there are three possible methods of contact with respondents; post, telephone or personal interview. Churchill (1983) discusses the advantages and disadvantages of each approach in terms of the three key elements of survey administration.

1. Controlling the direction of the inquiry,

2. Securing co-operation from participants, and

3. Control over the information collected.

Both postal and telephone surveys suffer from the major disadvantage that administrative control is largely dependent on the quality of the mailing list or list of telephone numbers. A further disadvantage of postal and telephone surveys is the lack of control over securing a response from the

intended person. Postal surveys are also subject to sequence bias arising from the participant being able to read ahead in the survey and perhaps answering one question in the context of another. There are however, several advantages of using a mail survey, predominantly its cost effectiveness both in terms of money and time. It may also be anonymous which may encourage response to sensitive questions. A further advantage is the control of bias due to interaction between the interviewer and the interviewee which may arise in either personal interview or telephone surveys.

Through the co-operation of the collaborating institute, Sealink Stena Line (formerly Sealink British Ferries), it was possible for the researcher to travel on board the ferry and gain access to passengers while they were travelling. The 'on board' approach utilised in this research contains elements of both the personal interview and postal approaches. The postal element arises from passengers answering the survey unaided and in their own time while the personal interview element stems from the personal communication which the participant has with the researcher.

The approach is most similar to a postal survey from the information control viewpoint, and is therefore subject to the limitations of this approach in that questions requiring extensive probing cannot be asked. The directional control over the on board survey is however more similar to that found in a personal interview in that it is not reliant on a pre-determined list of people to contact, but identifies participants by their participation in a particular activity, in this case a ferry crossing on the Irish sea.

The issue of obtaining co-operation from passengers incorporates elements of both the personal interview and postal approaches. The personal interview element is that passengers can be encouraged to participate in the survey which will reduce the non-response rate. The lack of control over who actually completes the survey is potentially disadvantageous. The survey participant may not be the person who made the travel decision. Data regarding the purpose of the journey, who the participant is travelling with,

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Table 5.1: Comparison of survey approaches

Survey approach	Advantages	Disadvantages
Postal	Control of interviewee/ interviewer bias Cost effective Time efficient	Cannot ask probing questions Sequence bias Poor control over who actually answers
Personal Interview	Not dependent on quality of mailing list Researcher available to respond to queries Personal communication encourages participation	Expensive Bias due to interviewer/ interviewee interaction Not anonymous Interviewee wishes to appear 'good' to interviewer
On board survey	Personal communication encourages response Control interviewer bias Researcher available for queries	Cannot ask probing questions Sequence bias Lack of control over who answers the survey Time consuming Expensive

and ticket purchase information are important in assessing the relationship between the survey participant and the travel decision maker. The advantages and disadvantages of postal surveys, personal interviews and the on board surveys are summarised in table 5.1.

There are several other advantages gained from conducting the survey during the crossing:

- Passengers are more relaxed and may welcome participation in a survey as something to do during the crossing.

- The immediacy of the survey subject to the passengers' current situation may stimulate interest and promote participation from more

passengers.

- Greater sampling control can be achieved as non-respondents can be identified quickly and they can then be avoided.

Questionnaire design

The information required was collected from both sea and air passengers using a self-administered, undisguised, structured multiple choice questionnaire accompanied by an explanatory covering letter. A recent workshop on the total design concept in travel surveys considered the use of this type of questionnaire to be appropriate for the collection of factual travel and demographic data (Ampt *et al.*, 1985).

The structured, undisguised questionnaire is the most commonly used questionnaire in marketing research. Its main feature is the standardisation of both questions and answers among all respondents. The advantages of this type of questionnaire are outlined in Churchill (1983) as:

- It is simple to administer and easy to tabulate and analyse.

- It should not be difficult to answer.

- It should be reliable. If respondents were asked the question again they would give the same answer as before.

- It is also reliable for other reasons:

  - The frame of reference is often obvious from the alternative answers.

  - Alternative answers help to make the question clearer.

Churchill also identifies disadvantages of a structured questionnaire:

- The reliability of the fixed alternative questionnaire may be compromised if the available answers do not cover all the possible alternatives as this may force an incorrect answer.

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- Validity may also be reduced if the response categories themselves introduce bias. This may also occur if an appropriate response is omitted from the alternatives. The use of an 'other' category will not necessarily eliminate this bias.

The questionnaire used in the sea passenger market is contained in appendix A. The structure of a questionnaire deserves careful consideration. The first questions in particular are crucial and should not be in any way off-putting or threatening to the respondent. The first question in the questionnaire is intended to be straightforward to answer. The information requested by this question (date, name of vessel, departure and arrival times) could be simply collected by means of observation or it could be pre-coded before the survey took place. (This however would compromise flexiblity at the field level). Questions 1 and 2 are intended to provide the passenger with an easy start to a lengthy questionnaire.

In any questionnaire two types of information are being collected:

1. the basic information, without which there is no study,

2. classificatory information.

The proper order is to ask questions securing the basic information first (Churchill, 1983). More sensitive questions should be placed later in the questionnaire. The basic information required from this survey is the profile of benefits sought and consequently this is the next question to be asked (question 3). This type of question which asks for some opinion from the respondent, such as how important various attributes of the ferry service are to them, also makes a good introductory question as the passenger feels their personal opinion is of value. This may make respondents more disposed to answer the questionnaire.

The central theme of this research is that a passenger does not choose a service on the basis of only one attribute of that service, but on the basis

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of a combination of attributes of the service. Question 3 is the critical part of the survey as it is intended to assess the relative importance which an individual passenger places on the different attributes of the service. The choice of ferry service is considered in its role as one part of the total journey of a passenger. Question 3 is an extensive list covering many attributes of the ferry service and total journey. Passengers are asked to indicate the importance of each attribute by giving it a score of 1 to 5 with 1 being very unimportant and 5 very important.

The structure of the rating scale is based on the Q-sort approach which allows evaluation of the extent to which the respondents patterns of scores correlate (Green and Tull, 1978). A comparative study of rating scales (Freidman and Freidman, 1986) concluded that use of an itemised rating scale, as found in question 3, was preferable to a graphic rating scale in that the former produced less relative variability. In a subject centred approach such as this study, variation in responses to the service aspects listed will be due to differences among respondents (Cox, 1980). Cox concludes that five alternatives should be adequate, particularly for unsophisticated respondents, for the different points and further effort should be concentrated on increasing the number of points in the list rather than on developing a more refined ratings scale. The optimal number of points in the scale is determined by:

- The information capacity of the scale,

- The ability of respondents to differentiate between points on the scale,

- The amount of information presented in the question, and

- The information needs of the researcher.

One problem which may arise with this question is that a 'halo' effect, the tendency to give the same response to one service attribute as the last, may occur (Churchill, 1983). This partly results from the construction of the list of service attributes in which an attempt has been made to maintain a

logical progression from one point to the next. Service attributes covering similar areas are placed next to one another to allow the passenger to assess the relative importances more easily. Also to maintain the logic the list has not been randomised between questionnaires. A final criticism of this list of service aspects is that no reverse orientation questions have been included, due to the existing length.

Service attributes 1 (route of ferry crossing), 7 (short distance to travel to the ferry terminal) and 8 (short distance from the ferry to destination) are all associated wih the geographical convenience of the ferry crossing.

Travel time factors have also been shown to be important criteria in service choice. Shaw (1985). The inclusion of both service attribute 2 (length of time taken for ferry crossing) and service attribute 3 (total travel time) is intended to assess the importance which a passenger places on the ferry element of the journey with respect to time. Service attributes 7 and 8 (distance to and from ferry) also explore the role of the ferry crossing in relation to the total journey time. The other time factors are service attribute 4 (day of week of ferry departure), service attribute 5 (time of day of ferry departure) and service attribute 6 (short time required between check-in and departure). These service attributes explore the importance of the ferry schedule. Service attributes 11 and 12 are concerned with price and dicount fares. Service attribute 12 differs between the questionnaire used on the Fishguard-Rosslare and Holyhead-DunLaoghaire routes and the questionnaire used on the Larne-Stranraer route. This is simply a function of the different fare structures on these routes.

Service attributes 13 to 25 are concerned with the influence which the on board travel requirements of a passenger exert on the overall travel choice. Service attributes 21 (availability of a motorist's lounge), 23 (facilities for children) and 24 (facilities for disabled persons) will obviously be more applicable to certain groups of passengers than others. Service attribute 17 (availability of duty free goods) is not included in the questionnaire on the

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Larne-Stranraer route as duty free goods are not available on this route. The remaining service attributes (26: good rail connections, 27: good bus connections and 28: good road connections) return to the role of the ferry service as part of the overall journey and will differ in importance depending on whether or not the passenger is travelling with a car.

Questions 4 and 5 ask whether the passenger considered any other service attributes in addition to the list in question 3 when deciding to travel on a particular ferry service and if so, what were the additional service attributes, with question 4 acting as a filter for question 5. These questions are included to try and reduce bias in questions 6 (what is the most important point?) and 7 (what is the next most important point?) caused by a lack of appropriate alternatives in the list of attributes. Questions 6 to 8 (question 8: what is the least important point?) are the most difficult questions for the passenger to answer as they require him or her to discriminate between a large number of alternatives.

The remainder of the questions are concerned with collecting classification information. They are again largely drawn from research in the air industry and are factors which have been found to discriminate between segments. Where appropriate, points which were raised in question 3 which passengers responded to with an importance rating are asked more specifically in this part of the questionnaire. For instance, the importance of the distance to and from the ferry terminal was raised in attributes 7 and 8 and then question 12 and question 15 ask for the towns nearest the origin and destination of the journey, allowing the actual distances to and from the ferry to measured. The majority of the questions in this classificatory section are multiple alternative in structure with additional information as required being collected by a supplementary open response part to the question.

Questions 9 to 22 are concerned with travel behaviour, both past and present. Question 9 asks the passenger for the main purpose of his or her journey. A supplementary question is asked to determine whether the passenger is

visiting either friends or relatives.

Question 10 asks whether the passenger is on the outward or return leg of the total journey and is intended to set the frame of reference for the other questions relating to present travel behaviour. It also acts as a filter for questions 11 and 12 which ask how long the passenger will be away for and how long (s)he has already been away for, respectively. Questions 14 and 16 (whether the journey started at or will finish at a passenger's normal residence, place of holiday etc.) are intended to help clarify the frame of reference for questions 13 and 15 which ask for the towns nearest to the origin and destination of the journey. The difficulty here is to make passengers consider only this journey, either outwards or return (question 10), only as opposed to the total round trip to eventually finish at the place they started from.

Questions 17 and 18 explore past travel behaviour. Question 17 asks if this is the first time which the passenger has used a Sealink service on this route. Returning to present travel behaviour, question 19 asks if a passenger is travelling with a car and is again related to specific service attributes in question 3 particularly service attributes 21, 26, 27 and 28. Question 19 acts as a filter for question 20 (how did the passenger arrive at the ferry terminal and how will they continue their journey from the other ferry terminal) which is only answered by passengers who are not travelling with a car. Both questions 19 and 20 help to clarify how the ferry service integrates with the overall journey. Who the passenger is travelling with and the number of persons in the group is asked in questions 21 and 22. The number of persons in the group is used in the calculation of the survey coverage for individual sailings.

Question 23 considers the importance of certain entertainments or facilities on board a ferry. The same rating scale as for question 3 is used. Following on from question 23, question 24 is an open response question which gives the passenger scope to suggest any other entertainments or facilities they would

like to find on board. These two questions are intended to provide some respite for the passenger in that there has been relatively little opportunity so far for the passenger to give his/her opinion. Although this research is concerned with the factors which are important to a passenger in choosing the service, it is likely that the passenger having made the choice sometime ago is now more interested in the facilities on board the ferry.

(NB. The data collected by questions 23 and 24 are not analysed in this research, the reader is referred to Keating (1990) for analysis and further discussion of on board facilities.)

Questions 25 to 30 are concerned with the buying behaviour of the passenger; how the passenger finds out about the service (question 25), where the tickets are purchased (question 26) the type of ticket purchased (question 27), what discounts, if any, are used (question 28), whether the passenger intends to purchase either a cabin berth or a pullman lounge seat (question 29) and the length of time in advance of travel time which the tickets are purchased (question 30). This last question is particularly interesting as the Irish sea has a reputation for being a late booking market.

The final question asks if the passenger would be willing to participate in further work, if conducted. Both the wording and positioning of this question allows that one of the main benefits of this approach, anonymity, is not compromised. As an encouragement to passengers to give their name and address, Sealink provided a free holiday. Passenger's names will be entered into a draw to win this holiday.

Calculation of Sample size

The size of sample on each of the routes was determined for the first survey and then maintained for subsequent surveys. The sample size is approximately 10% of the passenger numbers which were expected to be travelling on the ferry, based on analysis of the same time period for the previous year. As can be seen from table 5.2, the passenger numbers on the

Table 5.2: Mean daily passenger carryings in July and August, 1988

Day of Week	Route		
	Fishguard Rosslare	Holyhead DunLaoghaire	Larne Stranraer
Monday	2663	4622	5436
Tuesday	2630	4392	4268
Wednesday	2510	4078	4418
Thursday	3117	5129	4947
Friday	2720	4704	7720
Saturday	3453	6562	7917
Sunday	2670	4723	6089

Table 5.3: Sample sizes in the sea passenger market

Route	Sample size
Fishguard-Rosslare	300 passengers
Holyhead-DunLaoghaire	500 passengers
Larne-Stranraer	500 passengers

Holyhead-DunLaoghaire route are roughly 1.7 times greater than those on the Fishguard-Rosslare route. Passenger numbers on the Larne-Stranraer route are roughly of the same magnitude as Holyhead-DunLaoghaire during the week but are higher at the weekend.

The sample sizes on each of the routes are contained in table 5.3. It was appreciated that owing to the extreme seasonality in the market, it might be difficult to achieve these target sample sizes, particularly for the off-peak surveys.

Sampling methodology

On each route the sample frame is defined as the twenty-four hour period over which the survey takes place. Both the Fishguard-Rosslare and

Holyhead-DunLaoghaire routes operate four sailings, two in either direction, every 24 hours. The sampling methodology employed is based on a proportional stratified sample with each of the four sailings (six sailings in the case of the Larne-Stranraer route) being a stratum. (See appendix B for proportional distribution of questionnaires.) The sampling technique employed differs from a true proportional stratified approach in that it is not possible to calculate the probability that a passenger will be selected to take part in the survey in advance of the survey being conducted. This is because the number of passengers on board is not known until the vessel sails. The probability of a person having been selected can however be calculated retrospectively using:

$$P_{selection} = \frac{Questionnaires\ distributed}{Passengers\ on\ board}$$

The proportional distribution of questionnaires between is sailings is again based on past data for the same period the previous year. The proportional distribution of questionnaires is determined using a chi-squared test (see appendix C). In the off-peak surveys particularly, there was no justification, based on the data for the previous year, to split the questionnaires proportionally and consequently 25% were distributed on each of the sailings.

The Pilot survey

A pilot survey of 100 passengers was conducted at the end of July 1989 on the Larne-Stranraer route and covered three sailings (see table 5.4).

Overall the effective response rate was 89% which is very high for a questionnaire survey. However, the pilot survey was conducted on daylight sailings only and it was considered likely that the response rate would be lower for night-time sailings. The performance of the questionnaire in the pilot survey was assessed by analysis of the number of non-responses for each question and checking that the answers given seemed to make sense in order to be

Table 5.4: Sea passenger pilot survey

Sailing	Vessel	passengers on board	questionnaires distributed
0700 ex Stranraer	St David	600	33
1130 ex Larne	St David	514	33
1900 ex Stranraer	Galloway Princess	635	34

sure that the passengers had understod what was being asked of them. The analysis of the pilot survey resulted in the restructuring and re-wording of a small number of questions, in particular question 9 (purpose of journey) and questions 23 and 24 (on board facilities). Any other problems arising were associated with coding boxes and these were easily remedied.

Survey methodology

Passengers are approached shortly after the vessel had left the berth and the safety announcements completed. During night sailings, particularly if the vessel is delayed or in rough weather, the questionnaires are distributed when all the passengers are on board. The purpose of the survey is explained and passengers are asked to co-operate by filling in a questionnaire in their own time, but before the vessel arrives at the destination port. Pens are provided if necessary and passengers told that the questionnaires would be collected throughout the crossing. Because of the nature of the last question which asks passengers for their name and address, passengers have the option of handing in the completed questionnaires to the information desk. Possibly the psychological effect of passengers knowing that the researcher was returning to collect the completed questionnaire contributed to the high response rate obtained.

A large number of passengers complete the questionnaire within a short time of receiving it and consequently these can be collected approximately 30 minutes later. Subsequent collections take place throughout the crossing.

Table 5.5: Timing of surveys in the sea passenger market

Ferry route	Survey			
	1	2	3	4
Fishguard-Rosslare	21/22 Aug 1989	20/21 Nov 1989	21/22 Feb 1990	21/22 May 1990
Holyhead-DunLaoghaire	22/23 Aug 1989	22/23 Nov 1989	23/24 Feb 1990	23/24 May 1990
Larne-Stranraer	24/25 Aug 1989	23/24 Nov 1989	25/26 Feb 1990	24/25 May 1990

It is usually apparent by the pen-ultimate collection whether or not the passenger is going to complete the questionnaire. If not, the questionnaire is collected. The general approach is to leave uncompleted questionnaires with passengers until the last collection in the hope that the sight of the researcher collecting other completed questionnaires would prompt the passenger to complete their questionnaire.

The full scale surveys

During the period from August 1989 to May 1990 four full scale surveys were conducted on each of the routes at three monthly intervals. The dates of the surveys are shown in table 5.5.

The timing of the surveys was determined by analysis of past data using time series techniques and consultation with Sealink research personnel. Four surveys were conducted to allow exploration of seasonal differences in the market. Each of the surveys corresponds to a seasonal period within the market:

- Survey 1: peak summer period,

- Survey 2: pre-Christmas off-peak,

- Survey 3: post-Christmas off-peak, and

Table 5.6: Response rates in sea passenger surveys

Survey Route	Questionnaires distributed	Questionnaires completed	Response Rate(%)
Survey 1			
Fishguard-Rosslare	300	245	81.6
Holyhead-DunLaoghaire	500	391	78.2
Larne-Stranraer	460	374	81.3
Survey 2			
Fishguard-Rosslare	249	188	75.5
Holyhead-DunLaoghaire	350	262	74.8
Larne-Stranraer	297	255	85.8
Survey 3			
Fishguard-Rosslare	148	101	68.2
Holyhead-DunLaoghaire	451	274	60.75
Larne-Stranraer	373	309	82.8
Survey 4			
Fishguard-Rosslare	300	192	64
Holyhead-DunLaoghaire	453	336	74
Larne-Stranraer	374	316	84.5
Overall	4255	3244	76.2

- Survey 4: intermediate, pre-summer period (shoulder period)

More detail regarding timings of surveys is contained in the itineraries for the surveys in appendix D. A summary of the number of questionnaires distributed, the number returned which were useable and the overall response rates for each of the surveys is shown in table 5.6.

The lower response rates found on the Fishguard-Rosslare and Holyhead-DunLaoghaire routes in survey 3 can almost certainly be attributed to the extremely rough weather conditions which were encountered on this survey. There are several aspects of the effect of the bad weather on the survey:

- Fewer passengers travelling as the storms had already lasted for more than one week.

- Of those passengers on board, a higher percentage than previously

encountered refused to participate in the survey as they were feeling
ill.

- A higher non-completion rate was found in this survey as passengers
  accepted the questionnaire but were then unable to complete it.

The fourth stage of the third survey was cancelled on the Fishguard-Rosslare
route as the vessel was delayed by the weather and it was important to main-
tain the survey schedule for the other routes, resulting in only a small sample
size being achieved. The problems posed by the bad weather were exacer-
bated on the Holyhead-DunLaoghaire route where a replacement vessel, *The
Lady of Man*, was in service as the regular vessel, the *St Columba* had been
damaged by fire the previous month. Although the replacement vessel was
adequate in terms of capacity and facilities for the number of passengers on
board, her smaller size leading to a reduced sea keeping ability resulted in
more passengers being ill than would normally be the case in this weather.

In contrast, the lower response rate from the Fishguard-Rosslare route on
the fourth survey is likely to be a function of greatly improved ship facilities
on this route. A new vessel, the *Felicity*, intoduced in May 1990 is larger
than her predecessor, the *St. Brendan* and has more passenger facilities.
More significantly from the viewpoint of conducting a survey on board, the
Felicity has a large number (200) of cabins available at a low price. This
last point reduced the accessibility of passengers and may indicate that the
survey methodology should be refined for this type of vessel. One possible
approach would be to leave questionnaires in the cabins.

Discussion

With the exception of survey 3, the surveys were all conducted within a
Monday to Friday period. Two sources of bias may be introduced here:

1. Little weekend travel is included in the survey.

2. The survey for a particular route was always conducted on the same day of the week. Fishguard-Rosslare surveys were conducted at the beginning of the week (Monday/Tuesday), Holyhead-DunLaoghaire surveys during the middle of the week (Wednesday/Thursday) and Larne-Stranraer surveys at the end of the week (Thursday/Friday). The exception to this as mentioned is survey 3. This survey was conducted over a Wednesday to Sunday period with weekend travel being included in both the Holyhead-DunLaoghaire and Larne-Stranraer surveys. The extent of the bias discussed above may be examined by comparison with survey 3.

A criticism of the questionnaire which did not become fully apparent until survey 4 on the Fishguard-Rosslare and Holyhead-DunLaoghaire routes is the unsuitability of the questionnaire to passengers who are travelling as part of an organised tour. This may account for the higher number of missing answers to certain questions, particularly parts of question 3 and also many of the questions relating to travel behaviour. As these passengers do not make the decision to travel on a particular ferry service they should perhaps be excluded from the analysis. (Passengers who do not answer question 3 are excluded from the analysis.)

Bearing in mind the limitations discussed above the survey methodology employed in the sea passenger market performed very well in terms of the amount and quality of data collected relative to the time and costs incurred and inconvenience to the passenger was successfully minimised.

5.2 The air passenger market

The three main airports in Ireland operating flights across the Irish sea, Belfast International, Belfast City and Dublin airports were approached with requests to conduct surveys in their departure lounges. This presented security problems for the airports and after much negotiation the difficul-

ties were resolved and access to passengers in the departure lounges was granted. At every stage in the research great emphasis is placed on maintaining compatibility as far as possible in the treatment of sea passenger and air passenger markets. The methodology employed in the sea passenger market forms the basis for that used in the air passenger market.

5.2.1 Data required

The data required in the air passenger market is summarised in figure 5.3. Owing to the shorter time available for passengers to answer a questionnaire the data required has been reduced as much as possible. The list of service attributes has been adapted from the sea passenger questionnaire to relate to an air service. A greater range of facilities and services are available on board a ferry than on an aircraft and therefore inappropriate points have been omitted.

5.2.2 Data collection

Survey adminstration

The departure lounge survey has the same characteristics as the on board approach.

An airport is a more stressful environment for a passenger than on board a ferry. Air passengers are not as relaxed as sea passengers who have already commenced the key element of their journey. Air passengers also answer the survey in their own time, before boarding their flight. The time however is much more restricted than in the sea passenger survey. The approach has several advantages over an interview approach:

- It keeps any inconvenience to passengers to a minimum and similarly does not interfere with the operation of the airport or disrupt passenger movement.

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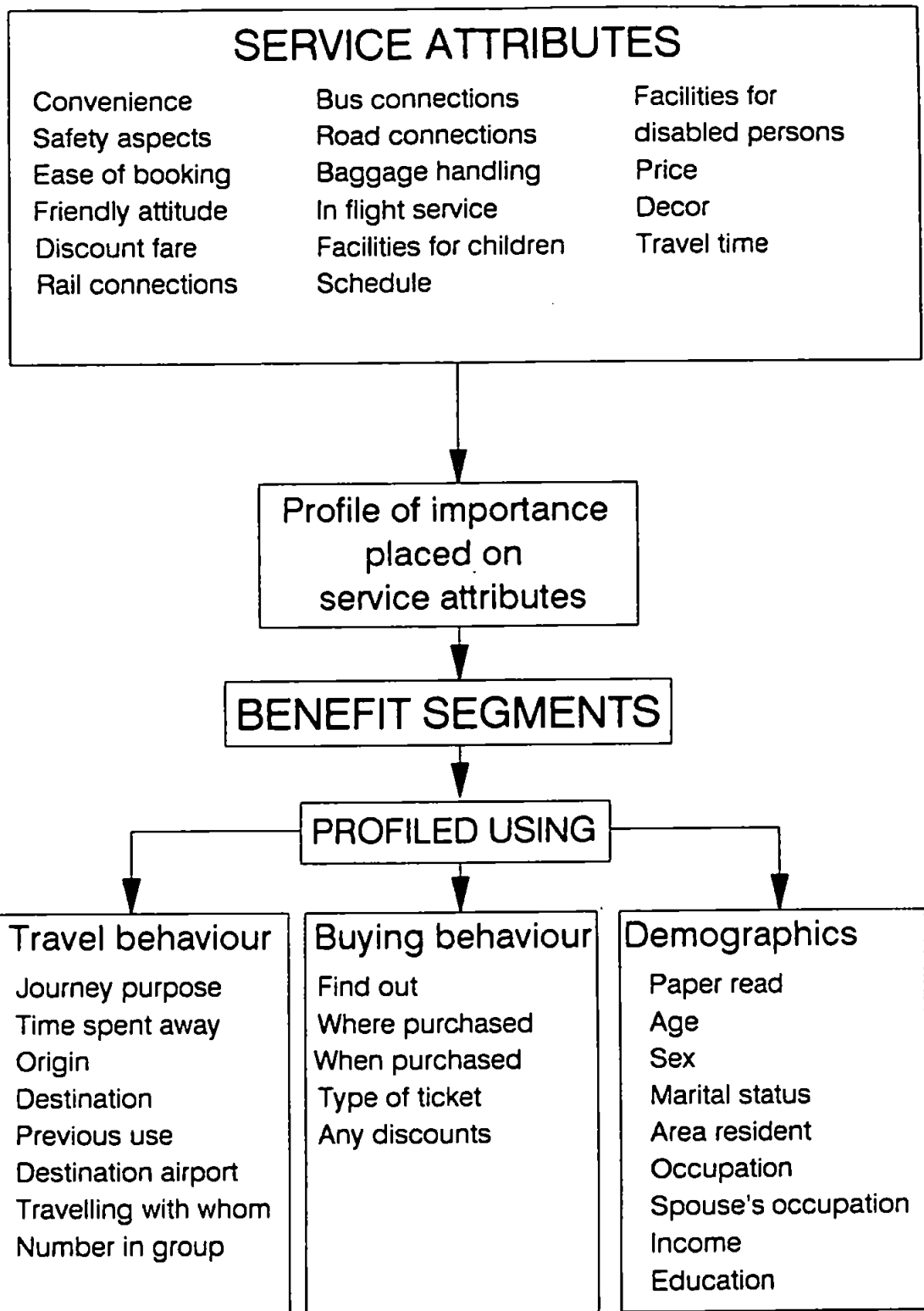
Figure 5.3: Data required in the air passenger market

- The passenger answers the questionnaire in a less stressful environment and in their own time. Once having checked in, the passenger knows that he or she is on time and in the right place. The survey is therefore being completed by a more relaxed passenger and this should increase the response rate.

- The passenger may welcome the survey as 'something to do' while waiting to board the flight. This may increase the response rate.

- More efficient use is made of the time available for the survey. It is possible to approach one passenger every minute, if necessary, rather than one passenger every ten minutes at best in an interview approach.

Questionnaire design

As mentioned above the questionnaire used in the air market is based on the questionnaire used in the sea passenger market. The major difference is the shorter length of the air questionnaire. Owing to the differences in survey environment where air passengers have considerably less time to answer the questionnaire every effort was made to reduce questionnaire length and therefore completion time without compromising the quality of the information collected. As a result of this some questions have been omitted and question content and question number do not match between the sea and air questionnaires. The air passenger questionnaire is contained in appendix E.

The first question is again intended to be simple to answer, in addition to providing important classificatory data. The importance of service attributes again employs a 5 point rating scale and is presented in question 2.

Questions regarding any other points the passenger may feel to be important, (questions 3 and 4) the most important (question 5), next most important (question 6) and least important attributes (question 7), purpose of trip (question 8), length of time spent away (questions 10 and 11) and origin

Table 5.7: Sample sizes and survey periods for airport surveys

Airport	Sample size	Survey period
Belfast International airport	300 passengers	2-3 days
Belfast City airport	200 passengers	2 days
Dublin airport	300 passengers	2 days

and destination of journey (questions 12 and 13) are all as the sea passenger questionnaire. There are however, no follow up questions to the origin and destination of the journey and mode of arrival at and departure from the airports (question 14) is now answered by all passengers. The question of whom the passenger is travelling with has an additional response category for those travelling with business colleagues. At Belfast City airport questions 15 (who the passenger is travelling with) and 16 (number of persons in group) have been combined into a two part question and an additional question 16 "What customer facility would you most like to see introduced at the airport?" has been included at the request of the airport management.

The questions on the subjects of past travel behaviour (question 17) and buying behaviour (questions 18, 19, 20, 21 and 22) have been simplified for use in the air passenger market. The remainder of the questions covering identification and characterisation of passengers are all as the sea passenger questionnaire.

Sample size

The sample size and the survey period for each of the airports are presented in table 5.7.

The sample sizes for the airports were determined by consultation with airport managers and are a compromise between what would be sufficient to give a representative picture of Great Britain to Ireland passenger move-

ments for the airport and what would be feasible in the restricted time available.

It should be noted that only passengers travelling from Ireland to Great Britain are included in the air passenger survey. The effect of only surveying eastbound passengers is that the day of the week on which the survey is conducted has a greater influence on the results.

Survey methodology

The surveys in the air passenger market followed the sea passenger surveys in order that the results from both would be comparable.

A pilot survey of 60 passengers was conducted at Belfast City airport at the beginning of August, 1989 and included passengers from 9 flights. Fifty-three useable questionnaires were returned giving an effective response rate of 88% which is again high for a questionnaire survey. Chi-squared analysis suggests there is no significant difference (at the 0.05 probability level) between the passenger distribution between flights during the survey period and the the distribution of questionnaires. Questionnaire performance is again assessed by consideration of the number of non-responses for individual questions and frequencies analysis established that the questionnaire did collect the required data and again only minor changes were required to the wording of a few questions following the pilot survey.

Four full scale surveys were conducted as soon as possible following the sea passenger surveys. Survey dates in the air passenger market are contained in table 5.8. The reverse order of the airports in survey 4 should be noted.

Only two full scale surveys (surveys 3 and 4) were conducted at Dublin airport. This was due to the time it took for security clearance to the departure gates to be granted because of the involvement of Special Branch both in The Republic of Ireland and Great Britain. An attempt in survey 1 to conduct a survey on the departure floor of the airport, before passengers

Table 5.8: Surveys in the air passenger market

Airport	Survey			
	1	2	3	4
Belfast International	11-13 Sept 1989	4-6 Dec 1989	5/6 Mar 1990	7/8 June 1990
Belfast City	14/15 Sept 1989	7/8 Dec 1989	8/9 Mar 1990	4/5 June 1990
Dublin			12/13 Mar 1990	31 May/1 June 1990

passed through the security check to the departure lounges was abandonned but acted as a pilot for later surveys.

Owing to the different physical survey environments encountered in the different airports a slightly different survey approach is employed for each airport. These are discussed below. The surveys at the three airports do however have two key points in common:

1. Passengers are approached after they have checked in. This approach enables the researcher to identify passengers who are travelling to different airports. At Belfast International and Belfast City airports passengers may be approached in the check-in queue during busy periods.

2. Questionnaires are collected in the departure lounge before the passenger boards the plane.

Belfast International Airport. The approach employed at Belfast International airport is to target flights to be surveyed in advance. Two-thirds of the airport's domestic traffic is concentrated on the London Heathrow route and therefore 200 questionnaires are distributed to Heathrow passengers with the remaining 100 distributed between other Ireland to Great Britain routes, predominantly Glasgow, Manchester and Birmingham. A

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sample size of 33 is used on the Heathrow flights and a sample size of 17 on the other routes.

The London Heathrow traffic is split approximately evenly between the carriers, British Airways and British Midland. British Midland passengers could only be approached in the departure lounge. The difficulty with this approach is that passengers do not start to come through to the departure lounge until about 30 minutes before the scheduled departure time. Boarding usually commences about 15 minutes before the actual departure time, therefore, if the flight is on schedule, this leaves very little time to conduct a survey of 33 passengers. This problem does not arise to the same extent for British Airways passengers as they could be approached either in the departure lounge or at the check-in area. The preferred methodology is to approach passengers after they had checked-in, briefly explain the purpose of the survey and leave them a questionnaire to fill in. If possible, questionnaire distribution is completed 30 minutes before scheduled departure time. The questionnaires are then collected from passengers on their way through the departure lounge. As far as possible, obviously subject to scheduling changes, the same flights were targetted in each survey. One disadvantage of this approach is that it is only possible, unless the departure times are within 10 minutes of one another, to administer one flight at a time. This means that the questionnaires for one flight must be collected before distribution for the next flight can begin.

Belfast City airport   At Belfast City airport more information is available regarding the number of passengers booked on each flight the day before. It is possible to identify flights to be surveyed, calculate the proportional distribution of passengers between these flights and distribute the questionnaires accordingly. Flights with fewer than 10 passengers are excluded.

Passengers are again identified at the check-in desk and approached after they have checked-in. As the check-in and boarding area are not physically

separate from one another (as at the other two airports) it is easy for the researcher to alternate between distribution and collection of questionnaires. This means that it is possible to adminster up to three flights simultaneously and therefore achieve a wider coverage of flights than possible at Belfast International airport. Belfast City airport is the easiest airport in which to conduct the survey and this is reflected in the higher response rates for this airport.

Dublin airport.   The survey at Dublin airport is conducted entirely in the departure lounge. An attempt was made to identify passengers at the check-in desk but this approach failed as passengers were aware that they were still some distance away from being in the right place to board the flight and were unsure if they had sufficient time to answer a questionnaire. The check-in procedure for a passenger at Dublin airport is less straightforward than at the other airports. The fact that a flight from Dublin to Great Britain is an international flight, as opposed to the domestic flights operating between Northern Ireland and Great Britain, allows a passenger to purchase duty free goods and it may have been felt that participation in a survey would reduce the time available for this. These factors all contributed to the passenger not being relaxed enough to participate in the survey at this stage. Passengers are not approached at Dublin airport until they are seated in the departure lounge, near the boarding gate, waiting to board their flight. The methodology employed at Dublin airport is therefore distinct from that employed in the other airports in that it is not possible to identify passengers accurately before they are approached. This difficulty is resolved by the use of an introductory filter question "Are you travelling to an airport in Great Britain?" It is not possible to target flights to be surveyed at Dublin and consequently this is the least structured of the surveys conducted. The response rates from each of the surveys are summarised in table 5.9.

Table 5.9: Response rates in the air passenger market

Survey Airport	Questionnaires distributed	Questionnaires completed	Response Rate(%)
Survey 1			
Belfast International	300	205	68.3
Belfast City	200	160	80
Dublin			
Survey 2			
Belfast International	300	241	80.3
Belfast City	200	182	91
Dublin			
Survey 3			
Belfast International	300	223	74
Belfast City	200	178	89
Dublin	300	208	69.3
Survey 4			
Belfast International	300	232	77.3
Belfast City	198	172	86.4
Dublin	295	232	78.6
Overall	2593	2033	78.4

Discussion

Despite the different approaches employed in the three airports they would appear to have some common sources of possible bias.

- As in the on board ferry surveys, the surveys at an airport were conducted on the same day of the week for surveys 1, 2 and 3. An attempt to redress this is made in survey 4 when the days of the week on which the surveys are conducted are changed by reversing the order of the surveys.

- The surveys in all the airports are biased towards early arrivals. Passengers who arrive early for a flight are the most accessible and also the most conducive to participating in the survey.

- No attempt has been made to account for the effects of delayed flights on passenger's responses given in the questionnaire. For example, a delayed flight might encourage passengers to give a higher rating to the departure time aspect than they would ordinarily.

- There is a disparity, particularly with passengers who are travelling for business reasons, between who selects and who pays for the service. It is likely that the data relating to buying behaviour will not be useful in identifying and characterising benefit segments.

More effective sampling control may have been achieved by conducting the surveys 'in flight'. However, with a field staff of one, the approach employed above has two main advantages over an in flight survey:

1. It is possible to cover a greater number of flights and destinations in the time available for surveying.

2. It is more flexible than an in flight survey in that if there are insufficient passengers on any targetted flight it is easy to switch any undistributed questionnaires to another flight.

Consideration of the response rates highlights the success of the survey approach.

5.3   The freight market

5.3.1   Data required

The data required for construction and profiling in the freight shipper's market is presented in table 5.4. The key difference between the passenger and freight markets lies in the purchasing of the sea or air service. In the passenger market the person who purchases the service will tend to also experience the service, but in the freight market this cannot by any means be assumed.

Benefit sought

The source of service attributes important in choice of service, is the freight modal and service choice literature. The idea of service choice being decided by a combination of attributes is common in freight service choice literature. Roberts (1971) suggests that the choice of mode is a function of:

- the level of demand,

- the length of haul,

- characteristics of the commodity being transported.

Cunningham (1982) holds that choice of mode is determined by:

- special offers,

- speed of transport,

- damage to the consignment,

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SERVICE ATTRIBUTES

Frequency	Schedule	Relationship with carrier
Reliability	Trading partner	Loss or damage
Transit time	Freight rate	Response to problems
Route	Special offers	Special requirements
		Urgent deliveries

Profile of importance
placed on
service attributes

BENEFIT SEGMENTS

PROFILED USING

Product

Eastbound proportion
Westbound proportion
Products
Special care
requirements
Consignment size

Transport services

Origin
Destination
Choice of mode
Routes
Own vehicles
Shipment frequency

Company characteristics

Location
Employees
Turnover

Control

Selection
Payment
Involvement
Job title
Department
Experience

Figure 5.4: Data required in the freight shippers market

- reliability of the carrier.

Gray (1985) proposes that the choice of transport service is based on three sets of characteristics:

1. those of the consignment,

2. the transport mode,

3. the person who makes the decision to purchase the freight transport service.

More recently, D'este and Meyrick (1990) have also espoused that three categories of factor influence choice of carrier:

1. route, which includes features such as:

   - frequency

   - capacity

   - convenience

   - directness and flexibity

2. cost, both the:

   - freight rate

   - other costs which may be incurred.

3. service factors such as:

   - delays

   - reliability and urgency

   - damage avoidance

   - loss and theft

   - a fast response to any problems

   - co-operation between the shipper and the carrier

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- documentation and tracing ability.

Bonoma and Shapiro (1983) offer urgency, specific application and size of the order as (situational) factors which will affect the benefits sought from an industrial purchase. The above factors have been consolidated into a list of service attributes which may be important in choice of service.

Data required for profiling

There are four categories of data which are required for profiling benefit segments in this market:

1. Product characteristics

2. Transport service characteristics

3. Company characteristics (demographics)

4. Control variables.

Much of the profiling data is derived from the list of service aspects. Several of the service aspects relate to particular needs of the product being shipped and consequently, further infomation about the product is sought. The same is also applied to the transport service. The majority of the service aspects are concerned with the transport service, therefore, information regarding the transport services used by the company is sought. McGinnis *et al.*, (1980) identify shipper characteristics which aid prediction of modal choice and may therefore be useful profiling variables, an example he uses is that a shipper using a truckload tends to have a lower value product, considers special offers to be important and is concerned with loss and damage. The model assumes that there is an inverse relationship between cost and quality of service.

The third category of characteristics is concerned with the characteristics of the company (company demographics). Company demographics such as

industry type (Cheron and Kleinschmidt, 1985) and size and location of firm (Wilson, 1986) may be used in profiling benefit segments.

The fourth category of data required has been termed 'control variables'. The role of these data is to assesss the quality of the other data collected. A workshop on response errors ond data collection (Ampt *et al.*, 1983) recognised a difficulty associated with freight surveys, that it is not always clear who makes the shipping decision Gray (1985) has cautioned that a particular problem with collecting data in the freight market is to ensure that the data are being provided by the 'right' person. Therefore, the final set of questions is concerned with the person who has answered the questionnaire. Additionally, 3 service attributes are concerned with price and information regarding the selection of and payment for freight services is sought.

5.3.2   Data collection

Administration

The administration for the freight survey is considerably less complex than that required for the passenger market in that a straightforward postal survey is used. This is the only realistic approach affording access to a large number of companies in the market. The advantages of a postal survey in terms of time and cost savings are well documented (Churchill, 1983; Green and Tull, 1978). The disadvantages of the approach with respect to information control and securing participation are discussed in section 5.1.2.

Questionnaire design

The data collection instrument used in the freight survey is again a self-administered structured questionnaire. A copy of this questionnaire is contained in appendix F.

Following the example of the passenger questionnaires the initial questions

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in the shippers' questionnaire are designed to be easy to answer, in addition to fulfilling a control function. The initial questions in this questionnaire are concerned with ensuring that the company does actually use Irish sea transport services (question 1) and determining who selects (question 2) and who pays for (question 3) these services.

The imbalance in Irish sea freight movements has been noted in previous work (Rich and Matear, 1989) and it was expected that eastbound and westbound freight movements would differ significantly in both magnitude and nature. Therefore, question 4 asks what proportion of a company's cross Irish sea freight moves in either direction (eastbound and westbound). The following questions concerning the products involved (question 5), special needs or requirements of these products (questions 6 and 7), seasonality in the movement of products (question 8), main origin and destination of products (question 9), typical size of product consignments (question 10) and transport modes (question 11) and ports (question 12) used for the movement of products are all duplicated to allow for differing requirements for eastbound and westbound freight movements. Question 13 asks whether the company operates its' own road vehicles between Great Britain and Ireland. The frequency of freight movements across the Irish sea is sought in question 14.

The importance of different attributes of the transport service to the shipper is not considered until question 15. This is in contrast to the passenger questionnaires which introduce the list of points relating to different attributes of the service at the earliest possible stage. In the freight questionnaires a number of classificatory questions are asked first so as to familiarise the respondent with the area of interest, before coming to the fundamental question: the importance of different attributes of the service. A five point rating scale is again employed, as are the questions on the most important (question 17), next most important (question 18) and least important points (question 19).

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Questions 20 to 23 (question 20: what is your involvement in the purchase of Great Britain-Ireland freight services, question 21: what is your department called, question 22: what is your job title, question 23: what are the job titles of other people involved in purchasing Great Britain-Ireland freight services) and question 27 (how long have you held your present position with this company) further attempt to assess the quality of information control achieved by the approach, that is whether or not the questionnaire has been answered by an appropriate person. The remainder of the questions are again classificatory and will be used to identify benefit segments in terms of company characteristics (question 24: what is the nearest town to where you work, question 25: approximately how many people does your company employ, at this location and in total, question 26: approximately what was the anual turnover of your company last year).

Sampling methodology

The sampling frame is constructed from two sources:

1. A report published by Trade Research Publications Ltd. which lists 351 British based companies who have known trading partners in The Republic of Ireland. Product information is also listed but no indication is given as to the size of the company either in terms of number of employees or turnover.

2. The Northern Ireland Trade Directory 1990. The criterion for selection in this part of the sampling frame is that companies have more than 100 employees.

Survey Methodology

The approach employed in the freight market is more straightforward than the survey approach in the passenger market. In contrast to the passenger surveys, only one full scale survey was conducted as opposed to the four in

the passenger market. The major problem encountered in the freight survey
is the construction of an appropriate sampling frame. As mentioned above
the reliance of the survey on the quality of the mailing list is an inherent
problem with postal surveys.

In addition to ensuring the required data are collected the pilot survey in the
freight market has an additional role, to assess the quality of the sampling
frame. A pilot survey of 50 questionnaires was conducted in April 1990.
Fifteen useable questionnaires were returned giving a response rate of 30%.
Qualitative analysis of the responses determined that the required data was
being collected successfully.

The approach employed in both the pilot and the full scale survey was to
address the questionnaires, which included a covering letter, to the 'Trans-
port Manager'. A postage paid envelope was enclosed for the return of the
completed questionnaire. The full scale survey was conducted in in June
1990. Two hundred and fifty companies were selected systematically from
each part of the sampling frame. The response rate for this survey is 26.4%.

5.4   The freight agent market

5.4.1   Data required

The data required in the freight agent market is presented in figure 5.5.

The list of service attributes has been ammended from the list for freight
shippers. Product related attributes have been ommitted. In the freight
agent market the list of service attributes is more closely aligned to the
purchase of Irish sea and air transport services rather than the more general
transport service in the freight shippers market.

SERVICE ATTRIBUTES

Frequency	Schedule	Relationship with carrier
Reliability	Shipper preference	Loss or damage
Transit time	Freight rate	Response to problems
Route	Special offers	Freight space availability

Profile of importance
placed on
service attributes

BENEFIT SEGMENTS

PROFILED USING

Operations

Services offered
Geographical range
Depots
Percentage empty
Road vehicles

Current use

Frequency
Routes
Useage level

Company characteristics

Location
Employees
Turnover
Type of company

Control (Respondent)

Involvement
Job title
Department
Experience

Figure 5.5: Data required in the freight agent market

Profiling data

Again four categories of data are sought, in addition to the importance of the service attributes:

1. Company operations

2. Current use of Irish sea transport services

3. Company demographics

4. Control variables (respondent characteristics)

The largest category describes the range of activities carried out by by freight agent, for example, does the company offer an airfreight service or documentation and customs clearance services and if the company operates its' own road vehicles. A second category seeks information about the Irish sea transport services currently used by the company. Detailed information on use of various routes and the level of use is sought. The company demographics and control categories are as the shipper market.

5.4.2 Data collection

Questionnaire design

Although the questionnaire used for the freight agents is based on that used for the shippers, less similarity exists between the two questionnaires used in the freight market than is found between the two passenger questionnaires. The questionnaire used in the freight agent market is contained in appendix G.

In the questionnaire for freight agents the introductory questions (numbers 1-3) are concered with assessing the agent's role in cross Irish sea movement of freight; whether the company only arranges transport, whether the company actually carries freight and what type of company they feel

themselves to be. Question 4 explores the range of services offered by the company between Great Britain and Ireland while question 5 investigates the geographical scope of the company's transport operations. Question 6 determines whether or not the company has a distribution depot in Great Britain and/or Ireland.

Questions 7 and 8 move on to explore the company's use of sea ferry and air services between Great Britain and Ireland in terms of frequency of use and routes used. Question 9 asks whether or not the company operates its own road vehicles between Great Britain and Ireland and acts as a filter for question 10 which investigates the proportion of journeys, in either direction, which are made empty. This question (no. 10) is the only specific consideration of the imbalance in the market. The only knowledge of the products carried by the freight agents comes from question 11.

In contrast to the shipper questionnaire which is governed by the differences in eastbound and westbound freight flows, the emphasis in the freight agent questionnaire is the difference in importance placed on service attributes for sea and air services. Consequently respondents are asked to complete two rating scale questions (question 12a and 12b), one for sea services and one for air services, depending on which they use. As two rating scale questions are involved the list of service attributes has been slightly reduced. Whether any service attributes, other than those listed, are important in the choice of service is covered by question 13 and this is also divided into a sea and an air section. Questions 14 to 16 which ask the respondent to discriminate between the points to identify the most important, next most important and least important attributes of the service(s) make provision for these points to differ between sea and air services.

The remainder of the questions are as the shipper questionnaire.

Table 5.10: The freight agent sampling frame

Source	Number distributed	Number returned	Response Rate (%)
I F F I	25	8	32
B I F A	25	13	52
A B C	25	6	24
Yellow Pages	25	8	32
IFFI Institute of Freight Forwarders, Ireland			
BIFA British International Freight Association			
ABC ABC Freight guide			

Sampling methodolgy

The composition of the sampling frame for the pilot survey of 100 companies and the relative performance of the various sources in terms of the response rate is given in table 5.10.

The criterion for inclusion in the sampling frame is that a company must specify that it offers a service between Great Britain and Ireland. The major change following the pilot survey was the removal of the ABC Freight guide, which had a lower response rate than other parts of the sampling frame and the substitution of freight operators selected from the Northern Ireland Trade Directory.

Survey methodology

The surveys were conducted concurrently with those in the shippers market. The response rate for the pilot survey was 32%. The full scale survey again consisted of 100 companies systematically selected, and the response rate was 32%. No substantive changes were made to the questionnaire following the pilot survey and the completed questionnaires from both the pilot and the full survey are used in the analyses.

Discussion

The response rates in the freight market contrast sharply with those achieved in the passenger markets. However, in the context of the complexity and length of the freight questionnaires and the postal approach, the response rates are satisfactory and in line with what might be expected from a postal survey.

5.5 Summary

This chapter has furnished the data from which the benefit segments will be constructed and profiled in the 4 sectors of the market. The analytical methodology for the construction of benefit segments is developed in the next chapter.

Chapter 6

Analytical methodology

A large volume of data are collected from the surveys described in the pre-
vious chapter. Because of the volume of data involved it is necessary to
gain an appreciation of the structure of the data collected before benefit
segments are constructed. Therefore, two sets of analyses are performed for
each market:

1. Preliminary analysis to examine the structure of the market.

2. Benefit segmentation analysis which is the focus of the research.

The analytical methodologies employed for preliminary and benefit segmen-
tation analysis are discussed in this chapter.

6.1 Preliminary analysis

This first set of analyses is concerned with improved understanding of the
structure and behaviour of the constituent parts of the market before un-
dertaking the more complicated analysis to derive benefit segments in the
markets.

The preliminary analyses provide overall profiles, or summaries, of the parts

of the market and identify areas which differ between subsets in each of the markets. The sea passenger market is first divided into car and foot passengers, car and foot passengers are then further divided by route and finally car and foot passengers on a particular route are divided by season of travel. Thus the preliminary analysis is conducted at four levels in the market (see figure 6.1). A similar process is followed in the air passenger market where the bases for division are business and non-business passengers, followed by airport and finally season of travel (figure 6.2).

The preliminary analyses may be viewed as a series of *a priori* segmentations. The essence of *a priori* segmentation is that the base(s) on which the market is to be divided may be determined before the data is collected. For example, the division of ferry passengers into those who are travelling with a car and those who are not. From the *a priori* segmentation viewpoint, the preliminary analyses employ a series of bases; the car and foot split is combined with route at level 3 and a combination of car/foot, route and season is the basis for dividing the ferry passenger market in the final step of the preliminary analyses.

Crosstabulations are performed to detect which variables (taken from travel behaviour, buying behaviour and demographic and socio-economic characteristics) differ significantly between the parts of the market. The chi-squared statistic (see appendix C) is used to determine where differences exist between the parts of the market. Differences which are significant at the 0.05 confidence level are discussed. Cramer's V is used to guage the strength of the chi-squared relationship.

The freight markets are not divided in the preliminary analyses as owing to their smaller size (in terms of number of respondents) this may lead to a fragmented view of the market. Preliminary analysis in the freight market concentrates on the overall profile of the markets.

Figure 6.1: Structure of preliminary analyses in the sea passenger market

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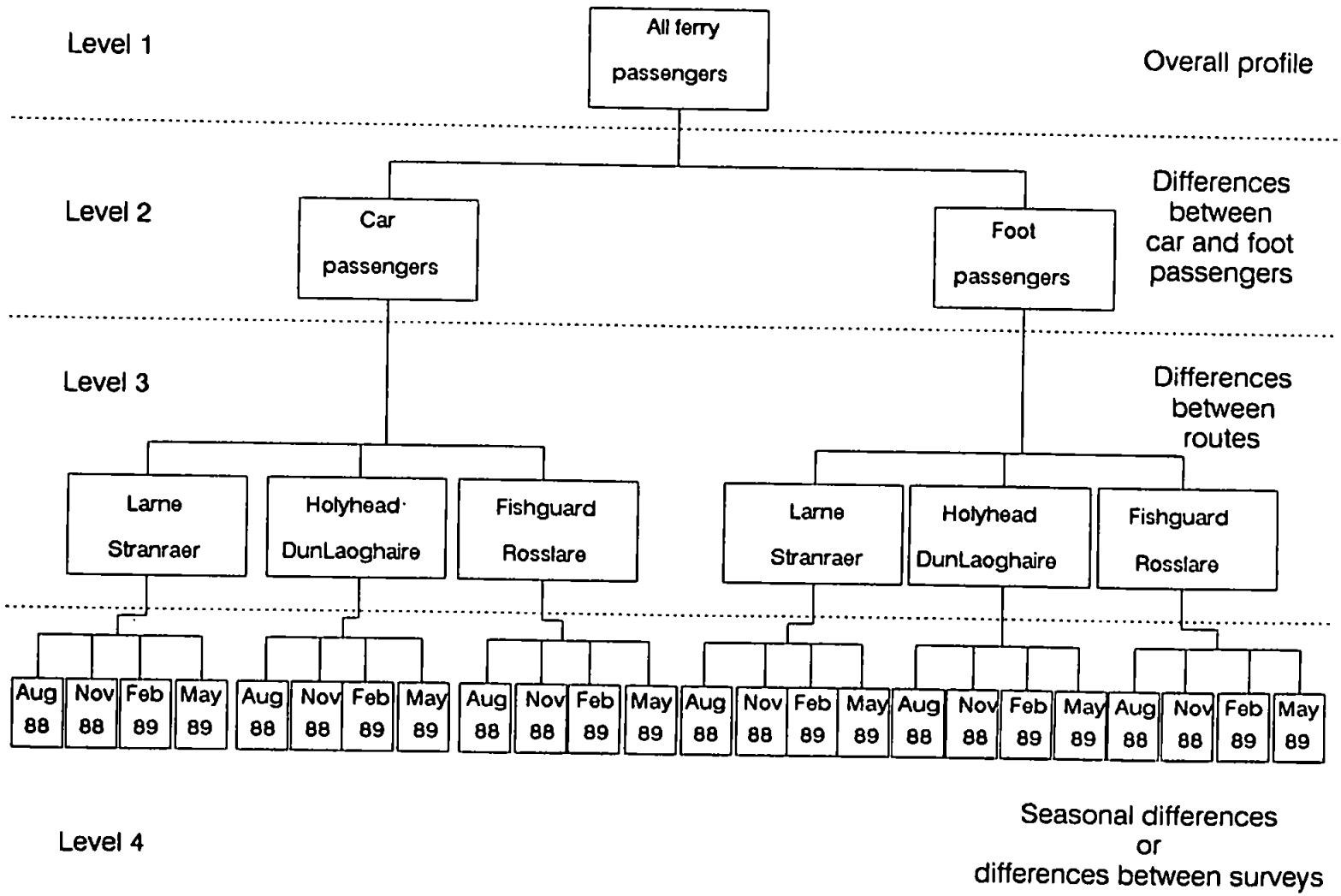
Figure 6.2: Structure of preliminary analyses in the air passenger market

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Level 1 — Overall profile of air passengers

Level 2 — Differences between business and non-business passengers

Level 3 — Differences between airports

Level 4 — Seasonal differences or differences between surveys

All air passengers

Business passengers | Non-business passengers

Belfast City | Belfast International | Dublin | Belfast City | Belfast International | Dublin

Sep 88 | Dec 88 | Mar 89 | Jun 89

6.2 Construction and profiling of benefit segments

Benefit segments are derived from the responses to the rating scale questions which asks the respondent to rate the importance of 28 service attributes (for ferry passengers) on a 1-5 scale with a score of 1 indicating that attribute to be very unimportant and 5 indicating that attribute was very important. An initial step is to plot the mean scores for each service attribute. It is important to inspect the raw data carefully before subjecting it to complex multi-variate analysis.

The construction and profiling of benefit segments is a three stage process:

1. **Data reduction.** The 28 attributes of the service are reduced, using principal components analysis, to between 6 and 9 components. The percentage of variance explained by principal components increases as smaller data sets are used. This is illustrated (for ferry passengers) in figure 6.3.

2. **Segment construction.** The responents are clustered on their factor scores into 6 groups which form benefit segments. Alternatively this stage may be viewed as data reduction in a second dimension (see figure 6.4). In the case of car passengers on the Larne-Stranraer route stages 1 and 2 together have the effect of reducing a 28 by 598 matrix to one with much more manageable proportions of 8 by 6.

3. **Segment profiling.** This stage is concerned with profiling the benefit segments in terms of travel behaviour, buying behaviour and socio-demographic characteristics. Crosstabulations are performed to identify areas of difference between the benefit segments.

6.2.1 Data reduction

Calantone and Johar (1984) suggest the purpose of using principal components analysis is to provide "better managerial interpretability and parsi-
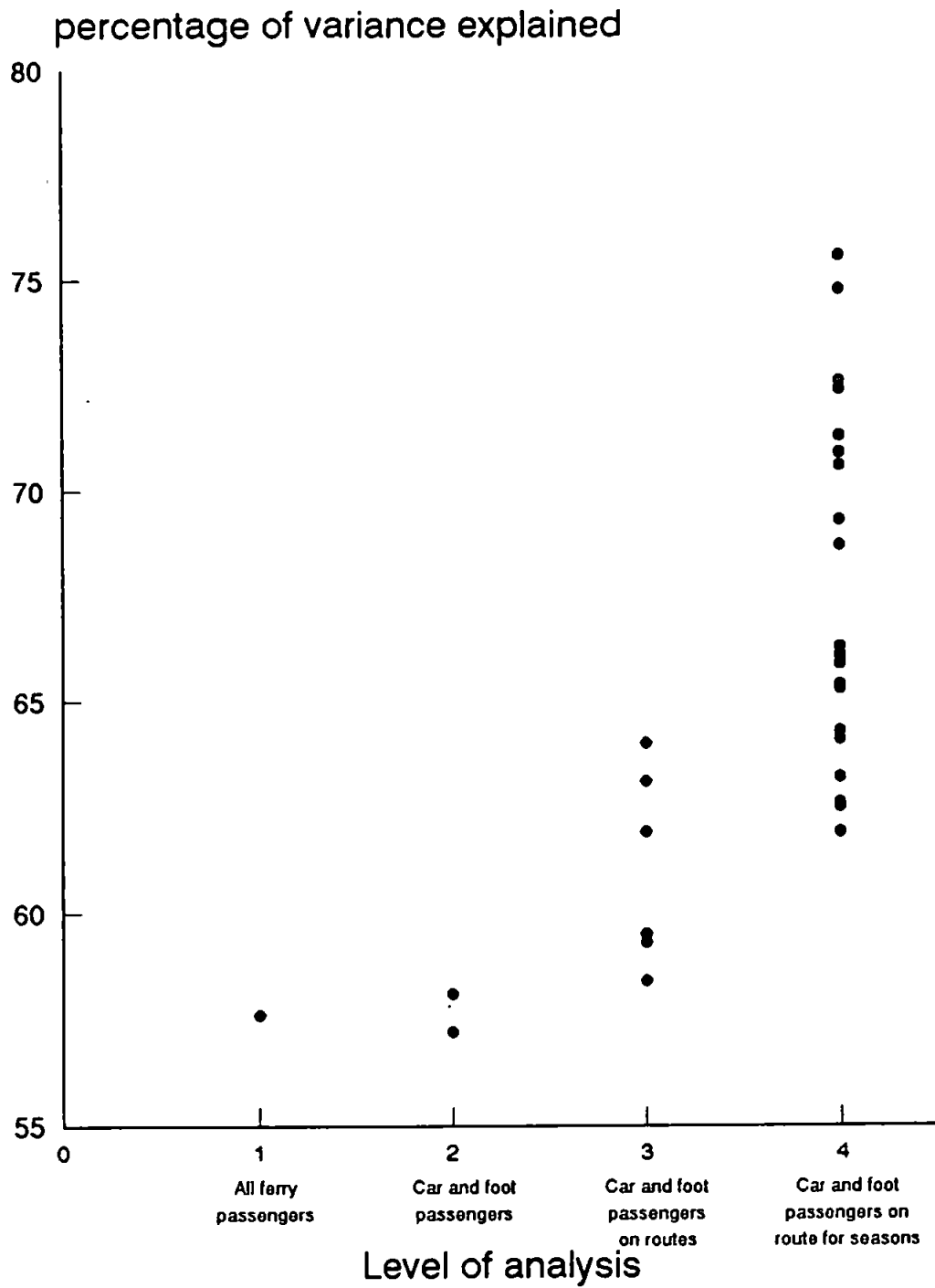
Figure 6.3: Percentage of variance explained by principal components analysis in the sea passenger market
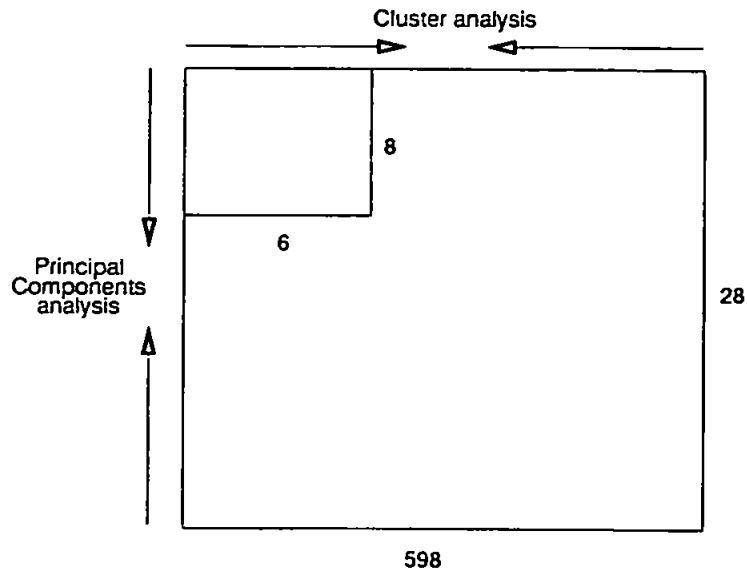
Figure 6.4: Data reduction in 2 dimensions using principal components and cluster analysis

money" of data.

Principal components analysis is employed for 4 reasons:

1. Removal of redundancy from the data. Sheth (1971) states:

> The statistical approach utilized in factor analysis [of which principal components is one method] is to maximally summarise all the variance (information), including covariance (interdependence) in as few factors as possible, while retaining the flexibility of reproducing the original relationship among the manifest variables.

2. To identify the key components important in choice of service. Thus the components developed are interesting in themselves as they provide a structure for the data in addition to serving as a means of data reduction.

3. Removal of colinearity in the data.

4. To obtain factor scores for use in further analysis.

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Kaiser's criterion is used to determine the number of components to be retained in the solution. Therefore, components with eigenvalues greater than or equal to 1 are extracted. This criterion is also employed by Goodrich (1977). Cattell (1966) suggests this method is reliable in exercises with between 20 and 50 variables.

In all data sets the principal components solution is rotated using a varimax rotation in order to simplify the factors. Rotation is a controversial aspect of all factor analyses (Sheth, 1971). Its only role is to aid the interpretation of factors and has no statistical significance *per se*. Although the factor matrix is transformed by the rotation the communalties and the percentage of total variance explained remain the same. It should be remembered that as the matrices have been rotated there is no significance in the ordering of the factors or components. A further feature of an orthogonal rotation such as varimax is that the resulting components are not correlated. The rational behind producing uncorrelated components is discussed in section 6.2.2. The contribution made by an individual attribute of the service to a component is assessed by considering its factor loading on a component. Service attributes which have a factor loading of more than 0.5 on a component are considered to be important in its construction. The resulting components in each of the data sets are discussed in chapters 10 to 12.

Factors scores are calculated using:

$$\hat{F}_{jk} = \sum_{i=1}^{P} W_{ji} X_{ik} \qquad (6.1)$$

where:
$\hat{F}_{jk}$ is the score of the ith factor of case k

W_{jk} is the factor score coefficient for the jth factor and the ith variable and

X_{ik} is the standardised factor score coefficient of the ith variable for case k.

The factor scores are used to represent the values of the components in further analysis. Factor scores calculated using equation 6.1 have a standard

normal distribution and consequently do not need to be standarised before being subsequently used in cluster analysis.

Thus, 28 service attributes are reduced to between 6 and 9 principal components. In the next stage of the analysis respondents are clustered on 6-9 as opposed to 28 variables.

6.2.2   Segment construction

A partitioning algorithm is used to cluster respondents into 6 groups. These clusters or groups form the benefit segments. Segments with 10 or more members are retained for profiling.

One advantage of a partitioning clustering method as opposed to hierarchical methods is that respondents are not irrevocably allocated to a group. Therefore reallocation of cases which may have incorrectly classified at an earlier stage is possible. Other disadvantages of hierarchical clustering methods are the tendency to cluster together objects linked by chains of intermediaries and the obscuring of distinct clusters by a small number of intermediate cases between clusters (Dillon and Goldstein, 1984).

The clustering algorithm employed has three steps:

1. Selection of initial cluster centres. The first 6 non-missing cases in the file are selected as initial cluster centres.

2. Updating values of initial clusters to derive classification cluster centres. Cases are assigned to the nearest cluster on the basis of squared euclidean distance. If the dimensions, on which cases are being clustered, are not orthogonal measures of distance based on squared euclidean distance become less meaningful (Sheth, 1970). When a case is assigned to a cluster the mean of that cluster is updated. As the cases are assigned the cluster centres move towards the concentrations of observations.

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3. In the final step each case is reassigned to the nearest of the updated classification cluster centres.

The partitioning method employed is sensitive to the order of cases in the file. Therefore it is necessary to run the clustering procedure, inputting the previous cluster centres as initial centres until the solution stabilises.

The resultant clusters, based on similarity in factor scores, form the benefit segments. The mean factor scores are calculated for each of the benefit segments. Whether or not a particular factor is important or unimportant to a segment is determined by the sign of the mean factor score; a positive mean factor score is taken to mean that a factor is 'important' while a negative mean factor score indicates that factor to be unimportant. The degree to which the factor is unimportant or important is given by the magnitude of the mean factor score.

Umbrella diagrams

The segments are represented graphically using an 'umbrella' diagram. Umbrella diagrams provide a 2-dimensional interpretation of the dimensions of the principal components in the clusters. Each component is represented by a spoke or radius of the diagram. Each spoke is scaled from -2.0 to +2.0, with zero being the mid-point. When all the 0 points on the spokes are joined into a polygon (dotted line) this represents the universal set (as the components have a standard normal distribution). This universal set (see figure 6.5) is the base against which the segments are compared. By plotting the mean factor scores of the components for each segment it may be more easily seen which components are important to a particular segment and which are less important. Umbrella diagrams allow comparison between the benefit segments to be made more easily.

The benefit segments are then labelled to reflect the factors which are particularly important or unimportant. The names or labels assigned to segments
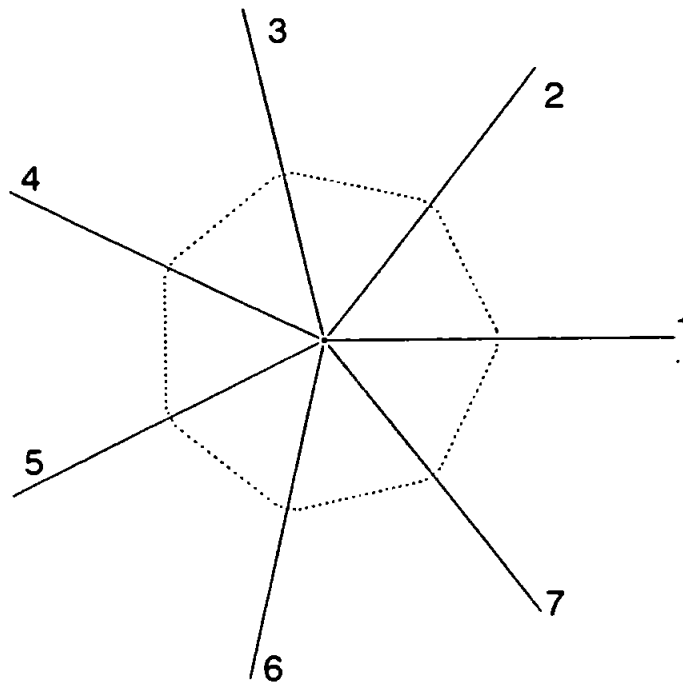
Figure 6.5: Structure of the umbrella diagram, the universal set

at this stage should be suggestive or descriptive rather than judgemental. This allows the benefit segments to stand alone in case they cannot be profiled easily.

6.2.3 Profiling benefit segments

The methodology for profiling benefit segments is the same as that used in the preliminary analysis of the passengers markets (see section 6.1). Crosstabulations are performed to detect how the segments differ in terms of independent variables; travel behaviour, buying behaviour and demographic characteristics in the passenger market(s) and product characteristics, transport services used and company characteristics in the freight markets. The chi-squared statistic, significant at the 0.05 confidence level, is again used to determine whether a relationship exists between the independent, or profiling, variable and segment membership. Variables which differ between benefit segments are used in profiling.

6.3 Summary

This second part of the thesis has collected data for benefit segmentation analysis and developed an analytical methodology which will allow benefit segments to be constructed and profiled in both the passenger and freight markets. The need for a preliminary analysis has been identified and a methodology for preliminary analyses developed. The results from both sets of analyses are presented in part III of the thesis; results from preliminary analysis are presented in chapters 7, 8 and 9 and results from benefit segmentation analysis are presented in chapters 10, 11 and 12.

Part III

Results

Chapter 7

Preliminary analyses of sea passenger survey data

The objective of this chapter (and chapters 8 and 9) is to provide a clear understanding of the data and, in particular, to identify where significant differences occur between the constituent parts of the markets. Owing to the volume and complexity of the data a strict sequence of analyses has been followed. The analyses presented here are by no means exhaustive, nor are they intended to be. The chapter is structured so as to provide a coherent framework allowing the results to be evaluated in the context of:

- The overall profile of ferry passengers.

- Differences between the obvious subgroups in the market, ie. car and foot passengers in the ferry market. This brings the analysis to the current degree of sophistication employed by operators in segmenting the market(s).

- Differences between the routes.

- Seasonal differences for individual routes.

The analyses are strictly sequential. Only variables showing significant differences at one stage are carried through to the next stage. This process of sccessive divisions of the market is in essence a series of *a priori* segmentations. Whether the passenger is travelling with a car, the route which (s)he is travelling on and the time of year serve as segmentation bases. The segments are defined by combinations of bases, for example, car passengers or car passengers on the Larne-Stranraer route travelling in November. Segments are then described, or profiled, using travel behaviour, buying behaviour and demographic and socio-economic characteristics.

7.1   Overall profile

In total 3244 (R=76.2%) useable questionnaires were returned from the ferry surveys, 1256 (R=83.4%) on the Larne-Stranraer route, 1265 (R=72.0%) on the Holyhead-DunLaoghaire route and 723 (R=72.5%) on the Fishguard-Rosslare route.

Travel behaviour

The ferry market is dominated by holiday traffic (table 7.1), more specifically by passengers who combine a holiday with a visit to friends or relatives. The length of time which passengers spend away from home is fairly short (table 7.2). There are a large proportion of repeat users in the Irish sea ferry market, almost three-quarters of passengers have used the service before (table 7.3). Car passengers are slightly more numerous than foot passengers (table 7.4). Of those passengers not travelling by car, almost equal numbers use bus and rail transport to arrive at and leave the port (table 7.5).

Almost half the passengers surveyed are travelling with their family (table 7.6). The majority of passengers travel in groups of between 2 and 4 persons, with 2 persons being the single most common group size (table 7.7).

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Buying behaviour

Corresponding to the high proportion of repeat users, most passengers find out about the service through previous use (table 7.8). Over half of the passengers purchase their ticket from a travel agent (table 7.9). Sealink shops or offices are the next most used ticket outlet. The most common type of ticket purchased is a return for car and passengers (table 7.10). Only a quarter of passengers take advantage of some form of concession or discount on their ticket price (table 7.11). The advance purchase time of tickets shows that a significant proportion of passengers buy tickets less than 24 hours before departure time (table 7.12). There is also however, a significant group of passengers who buy tickets more than three weeks ahead of travel.

Demographic characteristics

The age of ferry passengers appears to have a slight skew towards younger travellers (figure 7.1) although the proportion of passengers over 65 years old is higher than might be expected. More males than females (table 7.13) answered the survey and the majority of respondents are married. A higher than expected proportion (figure 7.2) of households have an annual income of less than £5000 or punts. A low proportion have incomes over £40,000.

This overall profile of the market is an aggregative or undifferentiated view. It contains some useful information for example, the high proportion of repeat users, but does not provide any guidance in determining who are the repeat users, are there more repeat users on a particular route? or are repeat users car passengers or foot passengers or both? For more detailed information of this nature it is necessary to divide the market on a certain criterion, or *a priori* segmentation base. The first criterion for dividing the market is whether the passenger is travelling with a car (car passenger) or not (foot passenger).
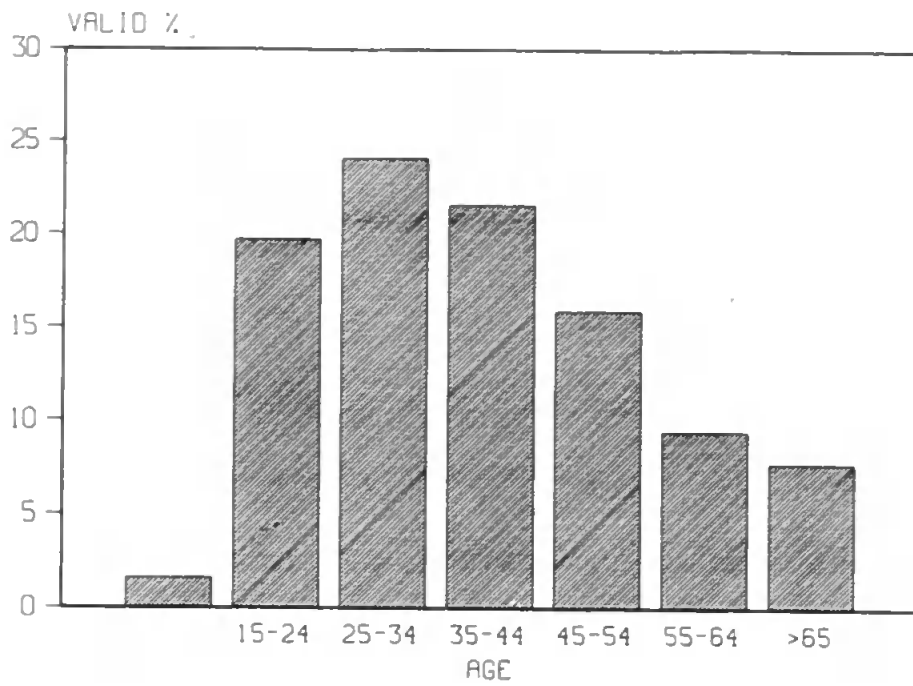
Figure 7.1: Age profile for ferry passengers
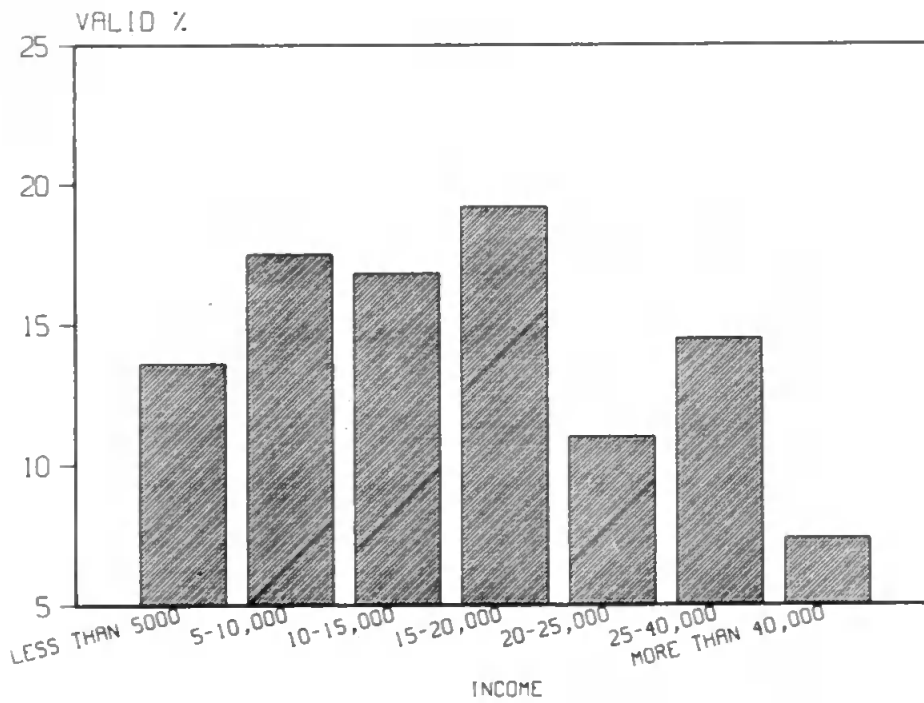
Figure 7.2: Income profile for ferry passengers

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Table 7.1: All ferry passengers: purpose of journey

Purpose of Journey	% of passengers
Holiday and VFR	46.6
Holiday only	23.5
Business	15.2
Other	14.8

Table 7.2: All ferry passengers: period of time spent away

Time period	% of passengers
Less than 24 hours	4.1
Less than 1 week	48.2
1-2 weeks	31.6
2-3 weeks	7.6
More than 3 weeks	8.4

(NB. passengers travelling with a coach fall into the foot passenger market.)

7.2 Differences between car and foot passengers.

The chi-squared test is used to determine if relationship exists between any variable and whether or not a passenger is travelling with a car. The chi-squared statistic, significance level and strength of association, according to Cramer's V for variables which are significantly different are presented in

Table 7.3: All ferry passengers: previous use of Sealink on route

Previous use	% of passengers
1st time user	26.7
Used before	73.3

Table 7.4: All ferry passengers: car and foot passengers

Car or foot	% of passengers
With car	54.0
Not with car (foot)	46.0

Table 7.5: Ferry foot passengers: means of arriving at and leaving ports

Mode of arrival or departure	Arrive %	Leave %
Bus	34.9	32.7
Rail	30.9	37.0
Lift in car	21.8	20.9
Other means	12.4	9.4

Table 7.6: All ferry passengers: who passengers are travelling with

Who passenger's are travelling with	% of passengers
Alone	24.2
Family	46.9
Friends	22.5
Family and friends	6.0
Colleagues	0.4

Table 7.7: All ferry passengers: number of persons in travel group

Number in group	% of passengers
1	24.5
2	34.3
3	12.9
4	12.6
5	5.1
6-10	3.6
over 10	7.1

Table 7.8: All ferry passengers: how passengers find out about the service

Means of finding out	% of passengers
Used before	63.1
Travel agent	19.1
Paper or magazine	2.3
Other advertising	1.4
Recommendation	9.0
Other	5.1

Table 7.9: All ferry passengers: where tickets are purchased

Type of ticket outlet	% of passengers
Travel agent	51.7
Sealink/airport	26.0
British Rail	9.1
Coach company	5.3
Other	8.1

Table 7.10: All ferry passengers: type of ticket purchased

Type of ticket	% of passengers
Sealink single for car and passengers	5.8
Sealink return for car and passengers	34.2
60/120 hour return/weekend excursion	13.5
Sealink foot passenger return	9.9
Sealink foot passenger single	5.3
British Rail single	1.4
British Rail return	7.9
Coach company single	2.4
Coach company return .	9.4
Other	10.3

Table 7.11: All ferry passengers: use of discounts

Discount used	% of passengers
No	70.0
Yes	30.0

Table 7.12: All ferry passengers: advance purchase time of tickets

Time before travel	% of passengers
Less than 24 hours	32.4
Less than 1 week	22.8
1-2 weeks	16.8
2-3 weeks	7.7
More than 3 weeks	20.2

Table 7.13: All ferry passengers: sex of passengers

Sex	% of passengers
Male	56.2
Female	43.8

Table 7.14: All ferry passengers: marital status

Marital status	% of passengers
Single	35.1
Married	57.4
Other	7.5

Table 7.15: Relationships between variables and travel with a car

Variable	χ^2	Significance level	Cramer's V
Purpose of journey	87.845	0.0000	0.16705
Time spent away	50.326	0.0000	0.12624
Previous use	10.926	0.0042	0.0587
Who traveling with	319.066	0.0000	0.31656
Number in group	509.757	0.0000	0.39987
Learn of service	47.540	0.0000	0.12279
Where tickets purchased	581.475	0.0000	0.42836
Type of ticket purchased	2504.411	0.0000	0.89236
Discount used	279.397	0.0000	0.31179
Berth purchased	19.922	0.0002	0.08
Advance purchase time	165.043	0.0000	0.22996
Age	276.036	0.0000	0.29467
Sex	41.269	0.0000	0.11429
Marital status	267.639	0.0000	0.29006
Income	238.503	0.0000	0.29552

table 7.15. All the relationships discussed below show statistically significant differences according to these tests.

Travel behaviour

The dominant reason for travel remains holiday/visiting friends and relatives for both car and foot passengers although the proportion is higher for car passengers (table 7.16). A higher proportion of foot passengers however, are on holiday without visiting friends or relatives. The proportion of car passengers travelling for business is almost twice that for foot passengers but a greater proportion of foot passengers are travelling for reasons other than holiday or business. Foot passengers spend a shorter period of time away (table 7.17), while a higher proportion of car passengers spend between 1 and 3 weeks away. The groups have similar proportions who spend more than 3 weeks away.

There is a slightly higher proportion of first time users among foot passengers

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(table 7.18). This may be influenced by coach tours of people visiting the UK or Ireland for the first time. The car passenger group remains dominated by passengers who are travelling with their family (table 7.19). The differing composition of the travel groups is reflected in the different group sizes for car and foot passengers (table 7.20). A higher proportion of car passengers travel in groups of 2, 3, 4 or 5 persons, the number of people who can fit in one car. In addition to there being more foot passengers travelling alone there are also more foot passengers in groups of over 10 persons. Presumably this may be attributed to the influence of coach tours.

Buying behaviour

The predominant means of finding out about the service (table 7.21) is previous use for both car and foot passengers although the proportion is higher for car passengers reflecting the higher proportion of repeat users already encountered. More foot than car passengers learn of the service through a recommendation or by other means. Other ways of finding out about the service include maps, travel guides and tourist information offices.

Not surprisingly, car and foot passengers purchase their tickets from different types of outlets (table 7.22). The majority of car passengers buy their ticket from a travel agent. Almost equal proportions of car and foot passengers buy tickets from a Sealink shop or office while 18% and 11% of foot passengers buy their tickets from British Rail and a coach company, respectively. Car and foot passengers purchase different types of tickets (table 7.23). Cross-tabulating between ticket type and whether or not a passenger is travelling with a car produces a statistically near perfect relationship (Cramer's V=0.89). This however, may be largely attributed to the structure of the question.

More foot passengers use discounts or concessions on tickets (table 7.24). The most common form of discount among foot passengers is a student or young person's concession.

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Foot passengers have a shorter advance purchase time for tickets (table 7.25) with a larger proportion not buying their tickets until less than 24 hours before travel time. A quarter of car passengers do not purchase tickets until less than 24 hours before travel time. If this is a year-round phenomenon, it has obvious and difficult implications for the service operator, for example, in the planning of staffing schedules and levels, and catering requirements and even port turnaround time and fuel consumption. A comparable proportion of car passengers do however purchase tickets more than 3 weeks ahead of travel time, but this is a relatively low proportion in what is essentially an holiday market.

Demographic characteristics

A relationship also exists between the frequency with which passengers read a national daily paper and whether the passenger is travelling with a car. A higher proportion of car passengers are frequent readers, suggesting that the operator may be able to focus newspaper advertising towards car passengers.

The age profile of foot passengers is highly skewed towards the younger age groups (figure 7.3) with one-third of foot passengers between 15 and 24 years old. A slightly higher proportion of older passengers is also found among foot passengers If anything, the age profile of car passengers (figure 7.4) is biased towards the middle range age groups with roughly equal proportions of passengers in the 25-34, 35-44 and 45-54 age groups with relatively few passengers outside of these.

Foot passengers are evenly split between males and females but there are more males among car passengers (table 7.26). However, it should be remembered that more foot passengers travel alone, while car passengers travel with their family. When the proportions of males and females among car passengers is considered in this context, it may be that more husbands or fathers (probably the drivers) answer the questionnaire and the predominance of males among car passengers reflects this. The majority of car

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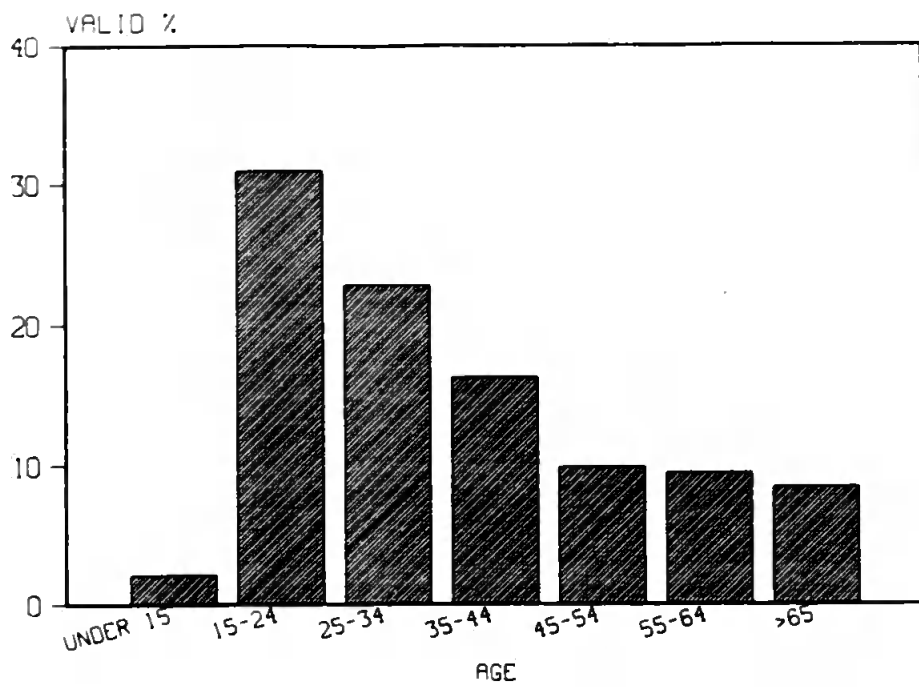
Figure 7.3: Age profile of foot passengers
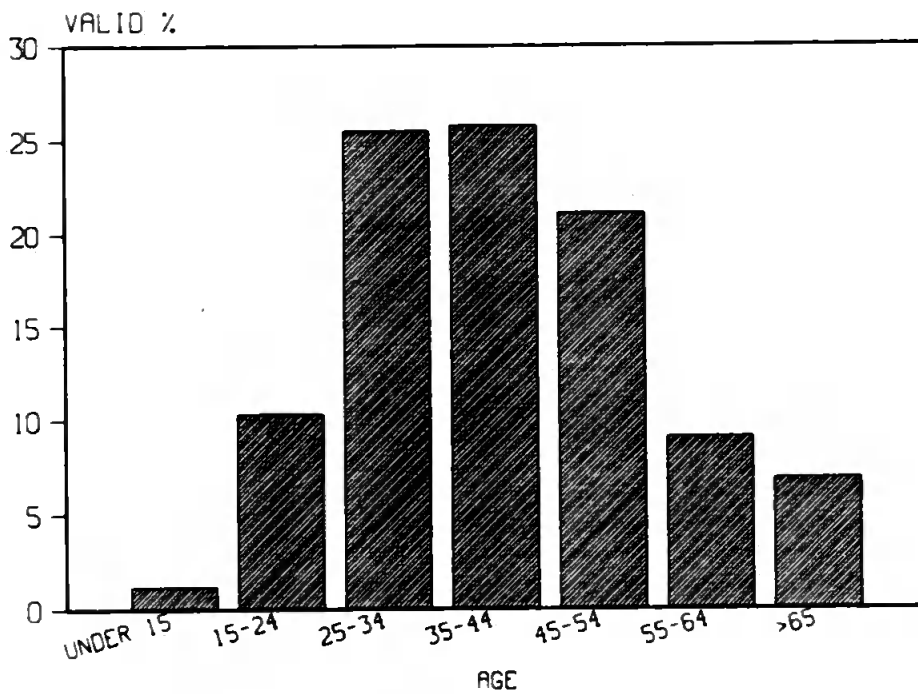
Figure 7.4: Age profile of car passengers

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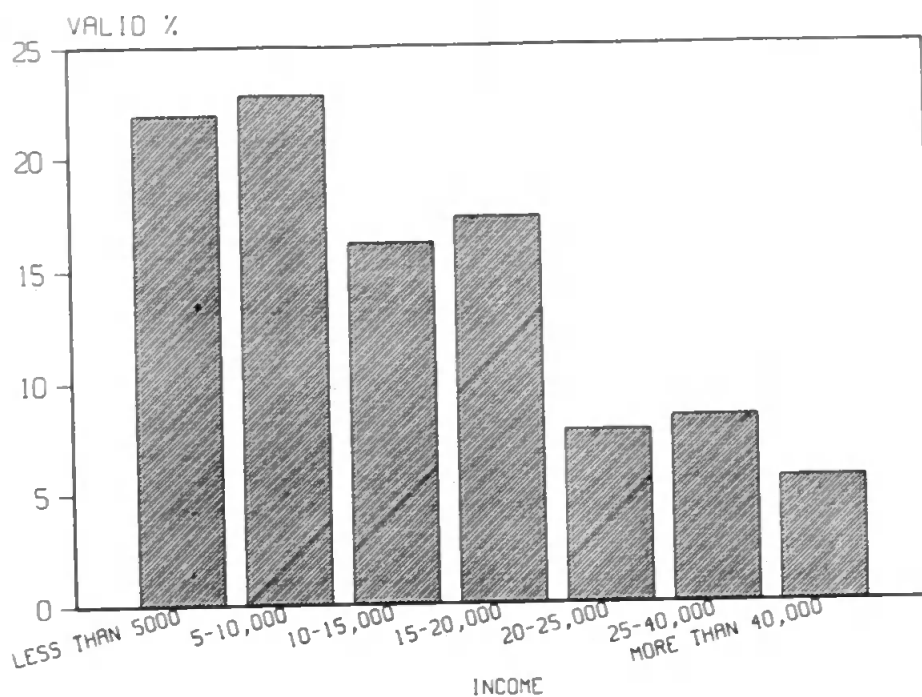
Figure 7.5: Income profile for foot passengers

Table 7.16: Car and foot passengers: purpose of journey

Purpose of Journey	Car %	Foot %
Holiday and VFR	48.6	44.5
Holiday only	20.4	26.9
Business	19.4	10.0
Other	11.6	18.6

passengers are married (table 7.27). Foot passengers have an income distribution skewed towards low incomes (figure 7.5), almost half have an anual income less than £10,000. This may be partly attributable to the higher proportion of younger people among foot passengers, but in general it would appear that foot passengers do have lower incomes than car passengers (figure 7.6). This is an important point worthy of more investigation as it has implications for pricing strategy and advertising policy.
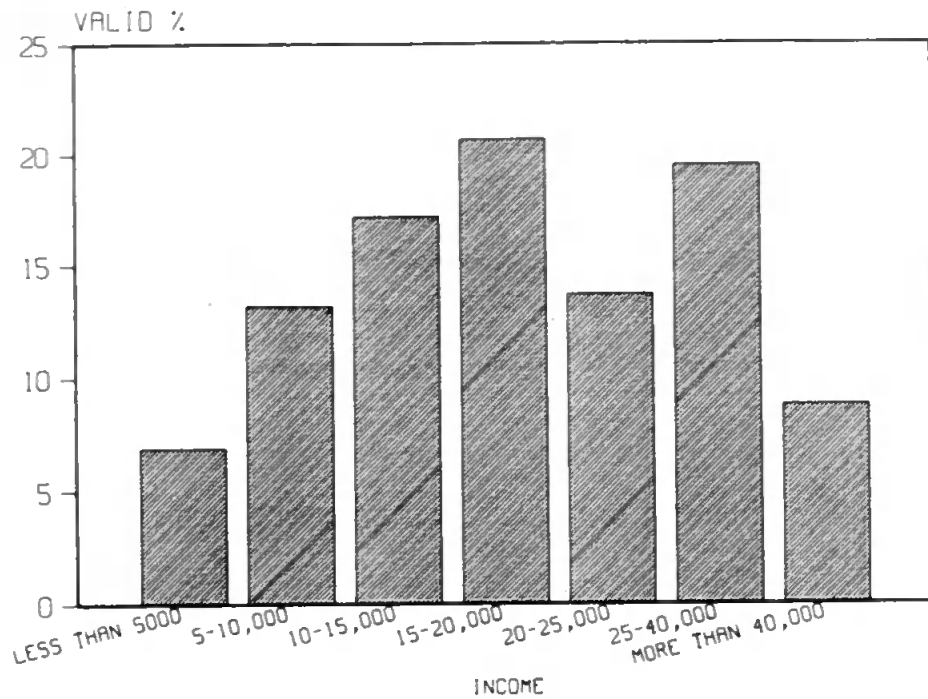
Figure 7.6: Income profile for car passengers

Table 7.17: Car and foot passengers: period of time spent away

Time period	Car %	Foot %
Less than 24 hours	2.4	6.1
Less than 1 week	46.0	51.2
1-2 weeks	34.1	28.1
2-3 weeks	9.1	5.9
More than 3 weeks	8.3	8.7

Table 7.18: Car and foot passengers: previous use of Sealink on route

Previously used?	Car %	Foot %
1st time user	24.4	29.5
Used before	75.6	70.5

Table 7.19: Car and foot passengers: who passengers are travelling with

Who passenger's are travelling with	Car %	Foot %
Alone	14.4	35.9
Family	59.4	32.0
Friends	18.5	27.0
Family and friends	7.4	4.3
Other	0.3	0.7

Table 7.20: Car and foot passengers: number of persons in travel group

Number of persons	Car %	Foot %
1	14.7	36.3
2	39.9	27.7
3	15.5	9.7
4	17.5	6.8
5	7.7	2.2
6-10	3.7	3.5
over 10	1.0	13.8

Table 7.21: Car and foot passengers: how passengers find out about the service

Means of Finding out	Car %	Foot %
Used before	67.2	58.8
Travel agent	18.8	19.0
Paper or magazine	2.2	2.3
Other advertising	1.1	1.9
Recommendation	7.5	10.5
Other	3.2	7.4

Table 7.22: Car and foot passengers: where tickets are purchased

Type of ticket outlet	Car %	Foot %
Travel agent	65.6	35.3
Sealink shop	26.5	25.5
British Rail	n/a	18.1
Coach company	n/a	11.4
Other	6.6	9.7

Table 7.23: Car and foot passengers: type of ticket purchased

Type of ticket purchased	Car %	Foot %
Car & pass single	9.8	n/a
car & pass return	61.5	n/a
120hr/weekend excur	22.3	n/a
Foot return	n/a	21.1
Foot single	n/a	11.5
BR single	n/a	3.0
BR return	n/a	17.3
Coach single	n/a	5.2
Coach return	n/a	20.2
Other	5.5	16.1

Table 7.24: Car and foot passengers: use of discounts

Discount used	Car %	Foot %
No discount	84.8	62.9
Student or YP	1.3	16.4
Family railcard	n/a	1.7
Senior citizen	3.3	5.8
Other	10.6	13.2

Table 7.25: Car and foot passengers: advance purchase time of tickets

Time before travel	Car %	Foot %
Less than 24 hours	24.5	42.0
Less than 1 week	21.0	25.1
1-2 weeks	19.6	13.6
2-3 weeks	10.2	4.6
More than 3 weeks	24.5	14.7

Table 7.26: Car and foot passengers: sex of passengers

Sex	Car %	Foot %
Male	61.5	50.1
Female	38.5	49.9

Table 7.27: Car and foot passengers: marital status

Marital status	Car %	Foot %
Single	23.8	48.9
Married	70.2	41.5
Other	6.0	9.5

7.3 Differences between routes

The third stage of the analysis further divides car and foot passengers according to the route on which they are travelling. Fewer differences between passengers on different routes are found for car passengers compared with differences in foot passengers between routes, suggesting that foot passengers are more diverse.

7.3.1 Differences between routes for car passengers.

Travel behaviour

A combined holiday and visit to friends or relatives continues to be the predominant reason for travel on all routes. The extent of this domination however varies between the routes, being greatest on the Holyhead-DunLaoghaire route (table 7.28). This is possibly due to the proximity of the large population concentration in Dublin. The Larne-Stranraer route has the highest proportion of business passengers and passengers who are travelling for other reasons. The greater proportion of business passengers on this route may be due to the shorter sea crossing and higher frequency of crossings and also the proximity of major cities, i.e. Belfast and Glasgow. The Fishguard-Rosslare route has the highest proportion of passengers who are travelling for a holiday only.

The shorter crossing and frequency of crossings may also influence the length of time which passengers spend away. While only a small proportion of car passengers on the Larne-Stranraer route spend less than 24 hours away (table 7.29), the corresponding proportion on each of the other routes is negligible. Almost two-thirds of passengers on the Larne-Stranraer route spend less than 1 week away. In contrast, the most common period of time away on both the Holyhead-DunLaoghaire and Fishguard-Rosslare routes is 1-2 weeks. In general, there is little difference between the time spent

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away on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes with Holyhead-DunLaoghaire having slightly more passengers spending between 1 and 3 weeks away and Fishguard-Rosslare having more passengers who are away for more than 3 weeks.

The three routes each display different characteristics with respect to previous use (table 7.30). The Larne-Stranraer route has the highest proportion of repeat users and the Fishguard-Rosslare route the lowest.

Buying behaviour

The differing proportions of repeat car users is reflected in the ways which passengers on different routes found out about the service (table 7.31); the Larne-Stranraer route has the highest and Fishguard-Rosslare the lowest proportion of passengers whose knowledge of the service stems from previous use. More than twice the proportion on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes, compared to Larne-Stranraer, find out about the service from a travel agent. A small proportion of passengers on the Fishguard-Rosslare route discover the service from an advertisement in a paper or magazine and a slightly higher proportion of passengers on this route have the service recommended to them. The ferry operator should consider its advertising policy carefully in the light of the small proportion of passengers who learn of the service through advertising.

The difference between routes according to where passengers purchase tickets again lies between Larne-Stranraer and the other routes (table 7.32). Fewer passengers on the Larne-Stranraer route buy tickets from a travel agent but more purchase tickets from a Sealink shop or office. The proportion of passengers obtaining tickets from other sources is also lower on this route.

The disparity between Larne-Stranraer and the other routes continues in the type of ticket purchased (table 7.33). A large majority of passengers on the

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Holyhead-DunLaoghaire and Fishguard-Rosslare routes purchase a return for car and passengers; less than 40% of passengers on the Larne-Stranraer route purchase this type of ticket. The most widely used ticket among car passengers on the Larne-Stranraer route is a 60 or 120 hour return which is not available on the other routes. The apparant lack of popularity shown to the comparable discount on the southern routes, the motorist's weekend excursion, may have been biased by the timing of the surveys. A higher proportion of single tickets are purchased on the Larne Stranraer route, possibly by passengers who had exceeeded the time limit of their 60 or 120 hour return.

The difference in discounts used between the routes appears to be that a higher proportion of passengers on the Larne-Stranraer route are able to use a senior citizen discount, while a higher proportion on the Fishguard-Rosslare route gain some other form of discount. This result should however be evaluated in the context of less than 20% of car passengers on any route using some form of discount.

The disparity between the routes regarding purchase of berths or pullman lounge seats, although significant, is due to the differing avaliablity of these facilities on the routes. Very few cabins are available on the Larne-Stranraer route and pullman seats are only available on the *St Columba* on the Holyhead-DunLaoghaire route.

Passengers on the three routes also exhibit differences with respect to advance booking time of tickets (table 7.34). One-third of car passengers on the Larne-Stranraer route do not purchase their tickets until less than 24 hours before departure. The proportion of late purchasers on the Holyhead-DunLaoghaire route is relatively low. A higher proportion of car passengers on the Larne-Stranraer route buy tickets less than 1 week and 1-2 weeks in advance than on the other routes. Only a small proportion of car passengers on the Larne-Stranraer route buy tickets more than 3 weeks in advance, compared with approximately one-third on both the Holyhead-DunLaoghaire

Table 7.28: Car passengers: purpose of journey

Purpose of journey	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Holiday/vfr	41.4	57.9	48.6
Holiday only	19.2	17.5	26.0
Business	26.4	14.1	14.4
Other	13.0	10.5	10.9

Table 7.29: Car passengers: time spent away

Time spent away	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 24 hours	4.7	0.9	0.5
Less than 1 week	61.3	34.5	35.5
1-2 weeks	23.3	42.5	41.7
2-3 weeks	5.0	12.5	11.3
More than 3 weeks	5.7	9.6	11.1

and Fishguard-Rosslare routes.

Demographic characteristics

The age of the passenger is the only demographic or identification type variable significantly related to route for car passengers (table 7.35). The main difference appears to be more passengers in the 25-34 year age groups, but less over 45 year olds, and more particularly, fewer over 65 year olds on the Larne-Stranraer route. Again there is little difference between the Holyhead-DunLaoghaire and Fishguard-Rosslare routes. The demarcation which appears to exist between the Larne-Stranraer route and the other two routes invokes the need to look more closely for differences between passengers on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes.

Table 7.30: Car passengers: previous use of service

Previous use	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
1st time user	15.9	26.2	35.9
Repeat user	84.1	73.8	64.1

Table 7.31: Car passengers: how passengers find out about the service

How passengers find out about the service	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Used before	75.8	64.9	55.6
Travel agent	11.5	22.1	26.7
Paper/magazine ad.	1.7	1.3	4.4
Other advertisement	0.8	1.1	1.6
Recommendation	6.9	7.4	8.7
Other	3.2	3.3	3.0

Table 7.32: Car passengers: where tickets are purchased

Type of ticket outlet	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Travel agent	59.4	69.5	70.8
Sealink shop	34.4	20.7	20.9
Other	4.7	7.8	7.2

Table 7.33: Car passengers: type of ticket purchased

Ticket type	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Single for car and passengers	12.4	7.9	8.2
Return for car and passengers	38.1	80.9	75.1
Special fares	42.8	6.1	9.4

Table 7.34: Car passengers: advance purchase time of tickets

Time spent away	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 24 hours	33.3	15.9	21.2
Less than 1 week	25.4	18.8	6.6
1-2 weeks	21.2	19.5	16.9
2-3 weeks	8.2	13.2	9.7
More than 3 weeks	11.8	32.6	35.6

Table 7.35: Car passengers: age of passengers

Age	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 15	1.7	1.1	0.5
15-24	11.1	9.5	10.1
25-34	29.5	21.8	23.8
35-44	26.1	25.9	25.2
45-54	19.0	24.0	21.1
55-64	8.3	9.3	10.1
Over 65	4.3	8.4	9.4

7.3.2 Differences between routes for foot passengers

Differences also exist between foot passengers on the three routes. Foot passengers differ with respect to all the variables discussed above for car passengers and additional areas of difference are mode of arrival at and departure from the ports, marital status and income.

Travel behaviour

In contrast to car passengers on the route, the Larne-Stranraer route has the highest proportion of foot passengers who combine a holiday with a visit to friends or relatives (table 7.36). The Holyhead-DunLaoghaire and Fishguard-Rosslare routes both have a higher proportion of passengers who are solely on holiday. The Larne-Stranraer route, this time in common with the car passengers on the route has a higher proportion of business travellers.

A slightly lower proportion of foot passengers on the Larne-Stranraer route, compared with the other routes, spend less than 24 hours away (table 7.37). This may be related to the absence of duty free goods on this route. Day returns for shopping, including the purchase of duty-free goods, are popular on the other 2 routes. In chapter 2 it was noted that 50,000 passengers travelled on day return trips in 1986. The majority of foot passengers on the Larne-Stranraer route spend less than 1 week away. Correspondingly, fewer Larne-Stranraer passengers spend more than 1 week away. Foot passengers travelling on the Fishguard-Rosslare route appear to spend the longest time away.

More passengers use bus to arrive at and leave the port on the Fishguard-Rosslare route (table 7.39), rail is the most common means on the Holyhead-DunLaoghaire route and a lift in a car on the Larne-Stranraer route. This may suggest that passengers on the Larne-Stranraer route travel to and from places nearer to the terminals than passengers on the other routes. Alternatively, foot passengers on this route may be driven to and collected

Table 7.36: Foot passengers: purpose of journey

Purpose of journey	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Holiday/vfr	49.8	41.6	41.1
Holiday only	14.8	32.8	36.1
Business	14.6	6.7	9.5
Other	20.8	19.0	13.3

Table 7.37: Foot passengers: time spent away

Time spent away	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 24 hours	4.7	0.9	0.5
Less than 1 week	5.23	6.75	6.45
1-2 weeks	62.5	47.3	39.2
2-3 weeks	23.1	29.9	32.8
More than 3 weeks	6.4	9.0	12.5

from the ports by a friend or relative. It has already been noted that more passengers on the Larne-Stranraer route combine a holiday with a visit to friends or relatives than on the other two routes.

Slightly more foot passengers on the Larne-Stranraer route travel alone (table 7.40). More passengers travel with their family on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes and slightly more travel with friends on the latter route.

Differences in previous use of the routes follows the pattern uncovered among car passengers with Larne-Stranraer having the most repeat users and Fishguard-Rosslare the least (table 7.38).

Table 7.38: Foot passengers: previous use of service

Previous use	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
1st time user	15.9	35.4	40.5
Repeat user	84.1	64.6	59.5

Table 7.39: Foot passengers: means of arriving at and leaving the port

Transport mode	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Arrive			
Bus	26.4	36.6	46.1
Rail	26.8	35.4	28.3
Lift in car	28.8	19.5	15.1
Other	17.9	8.6	10.5
Leave			
Bus	25.0	35.7	42.1
Rail	29.7	44.3	38.2
Lift in car	32.7	13.6	10.8
Other	12.6	6.4	8.9

Table 7.40: Foot passengers: who the passenger is travelling with

Who the passenger is travelling with	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Alone	38.6	35.1	32.8
With familiy	29.0	32.1	37.5
With friends	27.0	28.4	23.5
Family and friends	4.1	4.0	5.6
Other	1.4	0.3	0.7

Buying behaviour

More passengers on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes find out about the service from a travel agent (table 7.41). The pattern departs from that encountered among car passengers with a higher proportion of foot passengers on the Larne-Stranraer route learning of the service from a recommendation.

Most foot passengers, in common with car passengers, buy their tickets from a travel agent (table 7.42), although the proportions on each route are lower owing to the impact of other ticket outlets i.e., the rail and coach companies. More passengers on the Larne-Stranraer route continue to purchase tickets from a Sealink shop or office, while corresponding to the different modes used to reach and continue the journey to and from the port; the Holyhead-DunLaoghaire route has the highest proportion of passengers who buy tickets from British or Irish rail and Fishguard-Rosslare the highest proportion of passengers who purchase tickets from a coach company. The most commonly purchased type of ticket by foot passengers on the Larne-Stranraer and Holyhead-DunLaoghaire routes is a Sealink ticket (table 7.43), but coach tickets are the most common on the Fishguard-Rosslare route. As expected, the proportion of rail tickets is slightly higher on the Holyhead-DunLaoghaire route. Discounts are widely used on the Larne-Stranraer route, the most common of which is a student or young person's discount. On the Holyhead-DunLaoghaire and Fishguard-Rosslare routes discounts other than those suggested in the questionnaire are prevalent.

The most frequently encountered advance purchase time for tickets is less than 24 hours on all routes with the Larne-Stranraer route having the highest proportion of late booking passengers (table 7.44). The proportion is slightly lower on the Holyhead-DunLaoghaire route and the Fishguard-Rosslare has a slightly lower proportion of passengers booking less than 1 week in advance. There are fewest early booking (more than 3 weeks in advance) passengers on the Larne-Stranraer route and most on the the Holyhead-DunLaoghaire

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Table 7.41: Foot passengers: how passengers find out about the service

How passengers find out about the service	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Used before	73.0	52.9	46.5
Travel agent	9.1	23.3	27.5
Paper/magazine ad.	1.7	2.1	4.1
Other advertisement	0.2	2.7	3.0
Recommendation	12.2	9.0	10.4
Other	3.7	9.9	8.6

route.

Demographic characteristics

The largest age group on the Larne-Stranraer route (table 7.45), is 15-24 year olds which corresponds to the greater use of student or young persons discounts on this route. Fifteen to twenty-four year olds are also prevalent on the Holyhead-DunLaoghaire route, although to a lesser extent. Still on the Holyhead-DunLaoghaire route, there are proportionally more passengers aged between 45 and 64. The Fishguard-Rosslare route has slightly more passengers aged over 65 years old and also the highest proportion of 25-34 year olds. Marital status of passengers is also found to differ between the routes (table 7.46) with a higher proportion of single passengers on the Larne-Stranraer route, corresponding to the younger age profile. The differences in passengers' income between routes (table 7.47) may also be attributed to the younger age profile on the Larne-Stranraer route which has more lower income passengers in all categories up to £15,000 than on other routes.

Table 7.42: Foot passengers: where the tickets are purchased

Type of ticket outlet	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Travel agent	34.4	34.2	40.0
Sealink shop	34.4	22.2	16.7
British Rail	15.4	20.1	18.1
Coach company	9.5	10.1	17.8
Other	6.2	13.2	7.4

Table 7.43: Foot passengers: type of ticket purchased

Ticket type	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Foot return	21.8	21.4	18.3
Foot single	13.4	10.8	9.7
BR single	3.9	3.1	1.1
BR return	16.1	18.3	17.2
Coach single	2.8	6.5	6.7
Coach return	17.3	17.6	31.7
Other	24.8	22.3	15.3

Table 7.44: Foot passengers: advance purchase time of tickets

Time spent away	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 24 hours	47.0	37.5	44.0
Less than 1 week	26.4	25.0	21.8
1-2 weeks	13.6	13.7	13.5
2-3 weeks	3.7	5.12	4.8
More than 3 weeks	9.3	18.7	15.9

Table 7.45: Foot passengers: age of passengers

Age	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 15	1.0	3.9	—
15-24	37.1	29.0	23.8
25-34	23.7	20.5	27.1
35-44	14.8	15.8	20.8
45-54	8.2	11.3	9.7
55-64	7.0	11.1	9.7
Over 65	8.3	8.5	8.9

Table 7.46: Foot passengers: marital status

Marital status	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Single	53.0	48.7	41.6
Married	39.1	41.8	45.7
Other	7.9	9.6	12.7

Table 7.47: Foot passengers: income

Income (£)	Larne Stranraer %	Holyhead DunLaoghaire %	Fishguard Rosslare %
Less than 5,000	24.9	21.0	17.6
5-10,000	26.3	20.3	22.1
10-15,000	18.8	13.7	16.7
15-20,000	15.5	18.4	18.5
20-25,000	6.0	9.5	7.7
25-40,000	4.4	10.8	10.8
More than 40,000	4.2	6.4	6.8

7.4 Differences between surveys on routes.

Having discovered many statistically significant differences between passengers on the different routes, each route is further divided by survey, or season, to identify the extent to which seasonal differences exist on the three routes. The considerable variation in the level of passenger carryings between summer and winter months was highlighted in chapter 2. This section determines whether, in addition to the number of passengers carried, there is also heterogeneity with respect to the passengers themselves, for example, is there a higher proportion of repeat users of the service during peak or off-peak seasons?

At this stage of the analysis the variation in individual surveys on the individual routes becomes apparent, in particular the different timing of the survey in February has had a noticeable impact. Again only variables shown to differ significantly, according to chi-squared, between routes have been tested in this stage.

7.4.1 Seasonal differences among car passengers on the Larne Stranraer route

The following differences exist between surveys, or seasons, for car passengers on the Larne-Stranraer route:

- purpose of journey,

- time period spent away

- who the passenger is travelling with

- how many people the passenger is travelling with

- where is ticket is purchased

- the type of ticket is purchased

• advance purchase time of tickets.

Travel behaviour

The proportion of passengers who combine a holiday with a visit to friends or relatives is highest for the survey conducted in August (table 7.48). For the November survey however, business is the predominant reason for travel for almost half the car passengers surveyed. There are a higher proportion of passengers travelling for other reasons on the February survey. This survey took place on a Sunday and most of these 'other' passengers are travelling to, or from, a Rangers *versus* Celtic football match in Glasgow. A key role of these preliminary analyses is to identify groups of passengers such as this and which although it is unusual, should not affect the validity of the study. Any further effect of this group on the market could be tested by segmenting the market by purpose of journey. Despite the third (February) survey taking place on a Sunday, over a quarter of car passengers are travelling for business reasons. The May survey shows a return to travel for a combined holiday and visit to friends and relatives although, there are still a significant proportion of passengers travelling for business.

Car passengers in August spend longer away than at other times of the year (table 7.49). On the November, February and May surveys over 60% of car passengers spend less than 1 week away. This may be passengers taking a short break or possibly a second short holiday. The relationship between time spent away and purpose of journey deserves further attention but is outside the strictly defined parameters of the analyses presented in this chapter. The proportion of passengers spending less than one week away is greatest in February. This is probably due to a combination of the football match again and also passengers returning from a weekend break. Longer periods of time spent away again start to emerge in the May survey. There is a lower proportion of first time users in February.

Most passengers throughout the year are travelling with their family, the

Table 7.48: Larne-Stranraer car passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	54.1	22.9	36.8	43.9
Holiday only	26.8	15.3	16.7	16.4
Business	13.2	49.2	27.0	25.9
Other	5.9	12.7	19.6	13.8

Table 7.49: Larne-Stranraer car passengers: time spent away

Time away	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	2.4	7.89	5.3	4.8
less than 1 wk	44.9	69.0	73.9	60.3
1-2 weeks	35.1	15.5	13.5	25.9
2-3 weeks	10.2	1.7	2.40	4.2
more than 3wks	7.3	6.0	4.86	4.8

proportion is highest in August (table 7.50). The influence of the football match on the February survey is again apparent in the increased proportion of passengers travelling with either friends or with family and friends. The November and May surveys have higher proportions of passengers travelling alone, corresponding to the higher proportions of business passengers at this time of year. The most common group size remains 2 persons but there are more passengers in groups of 3, 4 or 5 in August and February.

Buying behaviour

More passengers buy tickets from a Sealink shop or office in November and less in May (table 7.52). Possibly passengers on holiday in May prefer to purchase tickets from a travel agent. An ordinary return for car and passengers is purchased by more passengers on the August and May surveys

Table 7.50: Larne-Stranraer car passengers: who the passenger is travelling with

Travel	Survey conducted			
group	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	13.5	30.5	13.9	22.5
With family	70.5	44.1	46.6	50.8
With friends	11.1	22.0	27.9	19.8
Family & friends	4.8	3.4	11.1	6.4

Table 7.51: Larne-Stranraer car passengers: number of passengers in group

Number in group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
1	14.5	30.3	14.1	22.2
2	35.7	43.7	34.5	42.9
3	18.8	13.4	17.0	10.6
4	16.4	10.1	21.8	12.2
5	9.7	1.7	8.3	7.4
6-10	4.8	0	1.9	3.2
over 10	0	0.8	2.4	1.6

Table 7.52: Larne-Stranraer car passengers: where tickets are purchased

Ticket outlet	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Travel agent	62.9	47.1	58.3	64.4
Sealink shop	33.7	46.2	34.3	28.2
British rail	1.5	2.5	2.0	0
Other	2.0	4.2	5.4	7.4

Table 7.53: Larne-Stranraer car passengers: type of ticket purchased

Type of ticket	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Car & passenger single	13.7	13.6	9.7	13.4
Car & passenger return	45.9	31.4	27.7	44.9
60/120 excursion	35.1	45.8	51.9	39.6
Other	2.9	6.8	9.7	1.6

(table 7.53). The most common type of ticket on the November and February surveys is a 60 or 120 hour return. The type of ticket purchased does not appear to have been influenced by the timing of the survey in February. The shortest booking period is found in November (table 7.54) with almost half the passengers not purchasing tickets until less than 24 hours before departure. Presumably this is due to passengers knowing the ferry is highly unlikely to be busy at this time of year and there is no pressure to purchase tickets early to be certain of travelling on the desired sailing. Perhaps surprisingly with a mix of holiday and business passengers, the May survey has the longest booking period.

Table 7.54: Larne-Stranraer car passengers: advance purchase time of tickets

Advance	Survey conducted			
purchase	August	Nov.	Feb.	May
time	1989	1989	1990	1990
less than 24 hrs	27.7	48.7	35.3	27.7
less than 1 wk	27.7	25.2	28.0	20.2
1-2 weeks	24.3	15.1	21.3	21.3
2-3 weeks	8.7	2.5	9.7	9.6
more than 3wks	11.7	7.6	5.8	21.3

7.4.2 Seasonal differences among car passengers on the Holyhead-DunLaoghaire route

Car passengers on the Holyhead-DunLaoghaire route also differ between surveys with respect to:

- purpose of journey

- period of time spent away

- composition and size of travel group

- type of ticket purchased

- advance purchase time

and additionally:

- discount used

- age of passengers

The August survey on the Holyhead-DunLaoghaire route is dominated by passengers travelling for a combined holiday and visit to friends or relatives (table 7.55). The greatest proportion of passengers travelling for a holiday only is found in the survey conducted in May and there are higher proportions of business and other passengers in the November and February

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surveys. The length of time which passengers spend away differs considerably between the surveys (table 7.56). The shortest time spent away occurs in February, in common with car passengers on the Larne-Stranraer route. This survey was conducted on a Friday/Saturday (as opposed to the Wednesday/Thursday for the other surveys on this route) and is probably influenced by passengers going away for the weekend. Passengers travelling in August spend the longest time away.

Three-quarters of the car passengers in August travel with their family (table 7.57). A higher proportion of passengers travel alone or with friends in November. In February there are again more passengers travelling with friends and also more mixed groups of family and friends. Smaller group sizes (2 persons) are found in November and May and larger groups in August (table 7.58).

Buying behaviour

The influence of the timing of the surveys is again evident in the type of ticket purchased (table 7.59). Over a quarter of passengers in February purchase a motorist's weekend excursion, compared with negligible or no purchases of this type of ticket in the other surveys. More passengers in February and May take advantage of some form of discount. The November and February surveys have shorter booking periods (table 7.60). A quarter of passengers buy tickets less than 24 hours in advance in November. In contrast, over 40% of passengers in August and May buy tickets more than three weeks in advance.

Demographic characteristics

A greater proportion of younger passengers (table 7.61) travel in November. The May survey however, is dominated by passengers who are over 55.

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Table 7.55: Holyhead-DunLaoghaire car passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	72.7	46.2	42.7	57.2
Holiday only	18.6	12.1	9.1	25.2
Business	4.1	26.4	30.0	8.2
Other	4.6	15.4	18.2	9.4

Table 7.56: Holyhead-DunLaoghaire car passengers: time spent away

Time away	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	0.5	2.3	1.9	0
less than 1 wk	14.1	58.1	70.4	22.8
1-2 weeks	53.8	20.9	23.1	53.2
2-3 weeks	20.1	11.6	0.9	11.4
more than 3wks	11.6	7.0	3.7	12.7

Table 7.57: Holyhead-DunLaoghaire car passengers: who the passenger is travelling with

Travel group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	6.5	23.1	13.9	13.0
With family	76.6	42.9	49.1	67.9
With friends	10.9	28.6	23.1	11.1
Family & friends	6.0	5.5	13.9	7.4

Table 7.58: Holyhead-DunLaoghaire car passengers: number of passengers in group

Number in group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
1	7.0	24.4	14.5	13.0
2	34.3	45.6	39.1	43.8
3	16.9	15.6	16.4	16.7
4	21.9	8.9	17.3	16.0
5	11.4	4.4	8.2	6.2
6-10	7.5	1.1	0.9	3.1
over 10	1.0	0	3.6	1.2

Table 7.59: Holyhead-DunLaoghaire car passengers: type of ticket purchased

Type of ticket	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Car & passenger single	5.5	9.9	11.8	6.9
Car & passenger return	90.0	82.4	54.5	86.8
Weekend excursion	0	0.3	28.2	0
Other	3.5	3.3	4.5	5.7

Table 7.60: Holyhead-DunLaoghaire car passengers: advance purchase time of tickets

Advance purchase time	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	10.4	27.5	21.1	12.7
less than 1 wk	14.4	23.1	28.4	15.2
1-2 weeks	21.4	19.8	19.3	17.1
2-3 weeks	13.4	14.3	11.9	13.3
more than 3wks	40.3	15.4	19.3	41.8

Table 7.61: Holyhead-DunLaoghaire car passengers: age

Age of passengers	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 15	2.0	–	–	1.2
15-24	8.2	16.5	11.8	5.6
25-34	23.5	28.6	23.6	14.8
35-44	27.0	24.2	26.4	25.3
45-54	26.5	19.8	28.2	20.4
55-64	6.1	6.6	6.4	16.7
over 65	6.6	4.4	3.6	16.0

7.4.3 Seasonal differences among car passengers on the Fishguard-Rosslare route

Seasonal differences also exist with respect to the same variables for car passengers on the Fishguard-Rosslare route as on the other two routes.

Travel behaviour

Differences in the purpose of journey between surveys on the Fishguard-Rosslare route (table 7.62) follows the pattern established by car passengers on the other two routes; more pure holiday travel in August and May, most combined holiday and visiting friends and relatives traffic in August and more passengers travelling for business and other reasons in November and February.

In contrast to the other two routes, November passengers on the Fishguard-Rosslare route spend the shortest period of time away (table 7.63) The February survey on the Fishguard-Rosslare route did not include a week-end component and this may have influenced the proportion of passengers sending less than 1 week away. The majority of August passengers spend 1-2 weeks away. The highest proportion of passengers spending more than 3 weeks away occurs in February. Higher proportions of first time users travel

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in August and May (table 7.64) with just over half the passengers having used the service before in August.

More passengers travel alone in February (table 7.65) and there is also a higher proportion travelling with friends. The August survey is dominated by passengers travelling with their family. The composition of travel groups is very similar in November and February although there are slightly lower proportions of passengers travelling alone or with friends in November. Groups of 2 persons are more common in November and May (table 7.66) and larger groups are found in August.

Buying behaviour

Fishguard-Rosslare is the only route where the way in which car passengers find out about the service exhibits seasonal variation (table 7.67). The lower proportion of repeat users in August is reflected in the lower proportion of passengers who knew of the service through previous use and there is a corresponding increase this month in the proportion who find out about the service from a travel agent. Also in August, a greater proportion of passengers give recommendation as their means of finding out about the service. The difference in the type of ticket purchased between surveys (table 7.68) is that more passengers purchase motorist weekend excursion tickets in August and November. The lower proportion of motorist weekend excursions purchased in February can be attributed to the survey being conducted on a Wednesday as opposed to a Monday. The shortest booking period occurs in November (table 7.69) and the longest in August.

Demographic characteristics

More younger passengers travel in February (table 7.70) and this again may be a reflection of mid-week travel. As in the surveys conducted on the Holyhead-DunLaoghaire route, there are also more older passengers in May.

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Table 7.62: Fishguard-Rosslare car passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	55.1	45.6	39.6	45.8
Holiday only	34.1	13.6	11.3	32.7
Business	4.2	24.3	30.2	13.1
Other	6.6	16.5	18.9	8.4

Table 7.63: Fishguard-Rosslare car passengers: time spent away

Time away	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	0	1.0	1.9	0
less than 1 wk	17.1	55.2	39.6	43.4
1-2 weeks	55.9	26.7	32.1	38.7
2-3 weeks	17.6	5.7	5.7	9.4
more than 3wks	9.4	11.4	20.8	8.5

Table 7.64: Fishguard-Rosslare car passengers: previous use of service

Used before	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
1st time user	48.2	24.8	21.2	34.3
Previous use	51.8	75.2	78.8	65.7

Table 7.65: Fishguard-Rosslare car passengers: who the passenger is travelling with

Travel	Survey conducted			
group	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	2.4	16.8	20.8	8.5
With family	78.1	49.5	41.5	63.2
With friends	11.8	22.4	34.0	19.8
Family & friends	7.7	9.3	3.8	8.5

Table 7.66: Fishguard-Rosslare car passengers: number of passengers in group

Number in group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
1	2.4	17.0	20.8	8.40
2	36.1	46.2	39.6	49.5
3	16.6	11.3	17.0	13.1
4	27.8	16.0	11.3	19.6
5	11.2	6.6	1.9	5.6
6-10	5.9	1.9	9.4	3.7
over 10	0	0.9	0	0

Table 7.67: Fishguard-Rosslare car passengers: how passengers find out about the service

Means of finding out	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Used before	44.1	65.4	64.2	60.0
Travel agent	37.1	17.8	26.4	19.0
Paper ad.	4.7	7.5	0	2.9
Other ad.	1.2	0	0	4.8
Recommendation	11.2	6.5	5.7	8.6
Other	1.8	2.8	3.8	4.8

Table 7.68: Fishguard-Rosslare car passengers: type of ticket purchased

Type	Survey conducted			
of	August	Nov.	Feb.	May
ticket	1989	1989	1990	1990
Car & passenger single	4.7	9.4	17.0	8.4
Car & passenger return	88.3	68.9	73.6	60.7
Weekend excursion	0	18.9	3.8	17.8
Other	6.4	2.8	5.7	13.1

Table 7.69: Fishguard-Rosslare car passengers: advance purchase time

Advance	Survey conducted			
purchase	August	Nov.	Feb.	May
time	1989	1989	1990	1990
less than 24 hrs	8.8	36.2	23.1	25.5
less than 1 wk	7.1	27.6	26.9	16.0
1-2 weeks	16.5	15.2	17.3	18.9
2-3 weeks	10.6	10.5	7.7	8.5
more than 3wks	57.1	10.5	25.0	31.1

Table 7.70: Fishguard-Rosslare car passengers: age

Age of	Survey conducted			
passengers	August	Nov.	Feb.	May
	1989	1989	1990	1990
less than 15	1.2	–	–	–
15-24	13.5	4.7	18.9	5.6
25-34	21.1	22.6	39.6	21.5
35-44	31.6	28.3	20.8	14.0
45-54	16.4	28.3	9.4	27.1
55-64	9.9	8.5	3.8	15.0
over 65	6.4	7.5	7.5	16.8

7.4.4 Seasonal differences among foot passengers on the Larne-Stranraer route

The purpose of foot passenger's journeys also differs between surveys (table 7.71). In contrast to the car passengers on this route, the highest proportions of foot passengers who are combining a holiday with a visit to friends or relatives travel in November and May. Following the pattern of car passengers however, most pure holiday makers travel in August and there are more business passengers in November and February. On all surveys, except for the survey conducted in August, a significant proportion travel for reasons other than holiday or business. More foot passengers in August are away for 1-2 weeks (table 7.72). Over 70% of foot passengers in November and February spend less than 1 week away with slightly more in February. The shorter journey time in February may again be influenced by the football match.

In August the majority of foot passengers use rail (table 7.73) to arrive at the port, in November similar proportions use bus or receive a lift in a car. A lift in a car is the most common way of reaching the port in February, while in May most passengers use bus. The differences between the surveys are more distinct for the means of leaving the port (table 7.74). In August most passengers again use rail. Rail is a more common means of continuing the journey in February. The August and February surveys were conducted on board the *Galloway Princess* whose schedule is more convenient for rail connections at Stranraer, than the schedule of the *St. David* on which the November and May surveys are conducted. The schedule of the *St. David* is more convenient for bus connections. In November most passengers receive a lift in a car suggesting the service is used at this time of year by people who either (or both) live fairly close and are visiting family, friends or business colleagues who also live fairly close to the ferry terminals on either side of the Irish sea. Conversely, they may be older passengers who find it difficult to change between trains and buses. Bus is the predominant

means of continuing the journey in May.

A lower proportion of foot passengers travel alone in August (table 7.75). Equal proportions travel with their family or with friends. The November and May surveys are very similar in terms of who the passenger is travelling with. There are a higher proportion of passengers travelling with friends in February, again probably due to the influence of the football match.

Buying behaviour

Corresponding to the means of arriving and leaving the port, and the schedule of the *Galloway Princess* more passengers purchase tickets from British Rail or Northern Ireland Railways in August and February (table 7.76) and more passengers in November and May purchase tickets from a coach company. The most common source of tickets in August and May however, is a travel agent and in November and February most tickets are purchased from a Sealink shop or office. The most common form of discount used on all surveys is a student or young person's discount, with the exception of February when over 10% of passengers use a senior citizen's discount.

The February survey has the highest proportion of passengers who buy tickets less than 24 hours in advance (table 7.77). More passengers in August and May purchase tickets more than three weeks in advance although these proportions are still very low.

Demographic characteristics

The major difference in the age profiles between the surveys is the much higher proportion of passengers aged between 15 and 24 in February (table 7.78). As a result of this the proportion of single passengers is also much higher in February (table 7.79).

Table 7.71: Larne-Stranraer foot passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	49.7	53.8	41.8	51.9
Holiday only	27.6	6.2	10.2	10.9
Business	9.8	18.5	20.4	12.49
Other	12.9	21.5	27.6	24.8

Table 7.72: Larne-Stranraer foot passengers: time spent away

Time away	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	6.3	5.4	4.1	4.6
less than 1 wk	49.4	70.0	73.2	63.1
1-2 weeks	36.7	13.1	16.5	21.5
2-3 weeks	1.3	3.8	3.1	3.1
more than 3 wks	6.3	7.7	3.1	7.7

Table 7.73: Larne-Stranraer foot passengers: means of arrival at the port

Mode of transport	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Bus	22.4	31.2	11.2	37.3
Rail	35.3	20.0	29.2	21.4
Lift in car	26.9	32.0	36.0	23.0
Other	15.4	16.8	23.6	18.3

Table 7.74: Larne-Stranraer foot passengers: means of continuing the journey

Mode of transport	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Bus	23.3	23.8	14.4	35.7
Rail	44.0	23.0	35.6	14.3
Lift in car	19.5	41.3	24.4	46.8
Other	13.2	11.9	25.6	3.2

Table 7.75: Larne-Stranraer foot passengers: who the passenger is travelling with

Travel group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	33.1	42.7	39.2	40.8
With family	29.4	29.8	24.7	30.8
With friends	29.4	26.0	34.0	20.0
Family & friends	8.1	1.5	1.0	3.8

Table 7.76: Larne-Stranraer foot passengers: where tickets are purchased

Ticket outlet	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Travel agent	36.9	30.8	25.3	41.9
Sealink shop	33.1	35.4	41.1	30.2
British rail	18.8	12.3	22.1	9.3
Coach company	5.0	14.6	5.3	13.2
Other	6.3	6.9	6.3	5.4

Table 7.77: Larne-Stranraer foot passengers: advance purchase time of tickets

Advance purchase time	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	44.7	45.0	56.8	44.8
less than 1 wk	24.5	32.6	21.1	26.4
1-2 weeks	10.7	14.7	15.8	14.4
2-3 weeks	3.1	4.7	3.2	4.0
more than 3wks	17.0	3.1	3.2	10.4

Table 7.78: Larne-Stranraer foot passengers: age

Age of passengers	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 15	1.2	–	1.0	1.6
15-24	30.4	30.7	61.8	33.3
25-34	19.9	27.6	14.3	31.8
35-44	19.3	15.7	9.2	12.4
45-54	7.5	11.0	9.2	5.4
55-64	11.2	5.5	4.1	5.4
over 65	10.6	9.4	1.0	10.1

Table 7.79: Larne-Stranraer foot passengers: marital status

Marital status	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Single	48.4	48.4	68.4	51.5
Married	42.2	44.5	26.5	39.2
Other	9.3	7.0	5.1	9.2

7.4.5 Seasonal differences among foot passengers on the Holyhead-DunLaoghaire route

Travel behaviour

There are more foot passengers travelling for a combined holiday and visit to friends or relatives in August and November (table 7.80) on the Holyhead-DunLaoghaire route. The May survey has the highest proportion of passengers who are on holiday but not visiting friends or relatives. Very few foot passengers are travelling for business on any of the surveys but the proportion of passengers travelling for other reasons is higher in November and February.

There are a significant proportion of 'day trippers' in both August and November spending less than 24 hours away (table 7.81). More passengers in August and May spend between 1 and 3 weeks away. The February survey is the only one on which less than 10% of passengers spent more than 3 weeks away.

The predominant means of arriving at the port in August and November is by rail (table 7.82). Slightly more passengers use bus in February and bus is the major means in May. Lifts in cars or arrival by other means are proportionally higher in August. In May an equal proportion to that which had arrived by bus also left the port by bus, suggesting greater use of through transport. Rail is the main means of continuing the journey in all other months (table 7.83) and accounts for over 50% of foot passengers in November and February. Lifts in cars and other means are again used by proportionally more passengers in August.

There is evidence of seasonality in the composition of the travel group on the Holyhead-DunLaoghaire route (table 7.84). In August the majority of passengers travel with their family, in November more passengers travel alone. Travel with friends is more common in February while in May, there is a fairly even split between passengers travelling alone, passengers travelling

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Table 7.80: Holyhead-DunLaoghaire car passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	47.4	37.3	43.9	37.3
Holiday only	34.3	31.7	22.3	42.2
Business	4.0	9.9	6.4	6.6
Other	14.3	21.1	27.4	13.9

Table 7.81: Holyhead-DunLaoghaire foot passengers: time spent away

Time away	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	10.1	8.6	3.1	4.7
less than 1 wk	30.3	57.1	63.1	40.8
1-2 weeks	36.0	19.6	27.5	35.5
2-3 weeks	12.4	3.7	3.8	8.3
more than 3wks	11.2	11.0	2.5	10.7

with family and passengers travelling with friends.

Buying behaviour

The most common source of tickets in all surveys is a travel agent (table 7.85). Differences occur however, in the proportions of passengers purchasing tickets from other sources. In August and November more passengers (than in February and May) buy tickets from British or Irish Rail. In February almost one quarter of foot passengers obtain tickets from sources other than those listed in the questionnaire. In May a lower proportion than expected buy tickets from a Sealink shop or office, but more purchase tickets from a coach company. Following these differences between surveys in the source of tickets it is expected that the type of ticket purchased will also show seasonal difference (table 7.86). In August and November the most

Table 7.82: Holyhead-DunLaoghaire foot passengers: means of arrival at the port

Mode of transport	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Bus	27.6	27.9	39.6	51.9
Rail	33.3	46.1	37.0	25.6
Lift in car	24.7	17.5	18.2	16.9
Other	14.4	8.4	5.2	5.6

Table 7.83: Holyhead-DunLaoghaire foot passengers: means of continuing the journey

Mode of transport	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Bus	28.7	27.2	35.4	51.5
Rail	37.4	53.2	54.4	33.1
Lift in car	23.0	13.9	7.6	9.2
Other	10.3	5.7	2.5	6.1

Table 7.84: Holyhead-DunLaoghaire foot passengers: who the passenger is travelling with

Travel group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	33.3	44.8	32.3	30.2
With family	47.2	27.3	21.1	31.4
With friends	14.4	25.5	44.1	31.4
Family & friends	4.4	2.4	2.5	6.5

common ticket is a standard foot passenger return issued by Sealink. A coach return is used by more passengers in May and in February more other tickets are used. The significant proportion of passengers obtaining tickets from other sources and using a different type of ticket in February may be explained by the presence of a large group of 80 school children travelling to a swimming competition in Leeds who obtained tickets through their school. This group is again evident in the higher proportion of passengers who use a student or young person's discount in February. Fewer passengers use any form of discount in November.

The swimming group may also partly explain the lower number of passengers who purchase tickets less than 24 hours in advance in February, (table 7.87), leaving the November survey with the largest proportion of late booking passengers. The swimming group is again in evidence in the age differences between the surveys (table 7.88), skewing the age profile for February towards younger passengers. There are more 25-34 year olds in November, more 35-54 year olds in August and more passengers who are over 55 in May.

There are a greater proportion of higher income passengers in May (table 7.89), possibly corresponding to the older age of passengers. August has more passengers with incomes between £10,000 and £20,000. February has slightly more lower income passengers but this may again be influenced by the swimming group.

7.4.6   Seasonal differences among foot passengers on the Fishguard-Rosslare route

Travel behaviour

The August, November and February surveys on the Fishguard-Rosslare route are dominated by passengers on holiday combined with a visit to friends or relatives (table 7.90). The November and February surveys con-

Table 7.85: Holyhead-DunLaoghaire foot passengers: where tickets are purchased

Ticket outlet	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Travel agent	37.0	31.3	27.0	41.0
Sealink shop	24.3	25.9	23.3	15.1
British rail	21.5	25.9	17.0	15.7
Coach company	10.5	6.6	8.2	15.1
Other	6.6	9.6	23.9	13.3

Table 7.86: Holyhead-DunLaoghaire foot passengers: type of ticket purchased

Type of ticket	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Foot passenger return	22.6	27.5	22.0	13.6
Foot passenger single	14.1	8.8	12.0	8.0
British Rail single	5.1	1.9	2.0	3.1
British Rail return	19.2	21.3	16.7	16.0
Coach company single	5.1	6.3	3.3	11.1
Coach company return	15.8	13.1	16.7	24.7
Other	14.7	18.1	24.7	22.2

Table 7.87: Holyhead-DunLaoghaire foot passengers: advance purchase time of tickets

Advance purchase time	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	39.1	44.8	29.8	35.3
less than 1 wk	23.6	29.1	27.8	19.6
1-2 weeks	13.2	9.7	14.6	17.6
2-3 weeks	5.2	5.5	7.9	2.0
more than 3wks	19.0	10.9	19.9	25.5

Table 7.88: Holyhead-DunLaoghaire foot passengers: age

Age of passengers	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 15	1.1	–	13.7	1.2
15-24	24.6	30.9	35.4	25.6
25-34	20.7	26.1	19.3	16.1
35-44	19.0	15.2	14.9	13.7
45-54	15.1	7.3	8.7	13.7
55-64	12.3	12.1	5.6	14.3
over 65	7.3	8.5	2.5	15.5

Table 7.89: Holyhead-DunLaoghaire foot passengers: income

Income (£)	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
<5,000	22.1	15.2	25.6	21.8
5-10,000	16.8	25.5	25.6	13.5
10-15,000	16.1	13.1	10.7	14.3
15-20,000	21.5	19.3	17.4	15.0
20-25,000	6.0	15.2	9.1	7.5
25-40,000	10.7	9.0	9.1	14.3
>40,000	6.7	2.8	2.5	13.5

Table 7.90: Fishguard-Rosslare foot passengers: purpose of travel

Purpose of journey	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Holiday/vfr	49.3	47.1	56.3	20.0
Holiday only	41.8	17.6	16.7	58.8
Business	3.0	13.2	14.6	8.8
Other	6.0	22.1	12.5	12.5

tain increased proportions of business passengers. In contrast, the May survey is dominated by passengers travelling for a holiday only with only 20% combining their holiday with a visit to friends or relatives. There are no significant differences between surveys in the period of time spent away.

The Fishguard-Rosslare route is the only route which differs significantly between surveys on whether a passenger had used the survey before (table 7.91). More than half the foot passengers in May are first time users of the service. The proportion of passengers who have not used the service before is also slightly higher in August.

There are a higher proportion of passengers travelling to the port by bus in August and May (table 7.92). A greater proportion (though only a small number) of passengers arrive by rail in November and February.

More passengers travel with their family in August and May (table 7.93); almost half travel alone in November. Fewer passengers than expected travel with friends in November.

Buying behaviour

Fishguard-Rosslare is again the only route where the means of finding out about the service differs between the surveys (table 7.94). More passengers in August and May found out about the service from a travel agent. Over 20% of passengers in February learn of the service through a recommenda-

Table 7.91: Fishguard-Rosslare foot passengers: previous use of service

Used before	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
1st time user	42.4	30.1	31.1	53.7
Previous use	57.6	69.9	68.8	46.3

Table 7.92: Fishguard-Rosslare foot passengers: means of arrival at the port

Mode of transport	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Bus	47.7	32.4	39.5	60.8
Rail	27.7	33.8	41.9	16.5
Lift in car	12.3	22.5	9.3	13.9
Other	12.3	11.3	9.3	8.9

Table 7.93: Fishguard-Rosslare foot passengers: who the passenger is travelling with

Travel group	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Alone	25.4	47.2	38.3	23.2
With family	43.3	29.2	34.0	41.5
With friends	26.9	16.7	27.7	24.4
Family & friends	4.5	6.9	0	8.5

tion and a significant proportion in May find out by some other means. More passengers purchase tickets from a travel agent in August and November (table 7.95) than in February and May. Other tickets purchased in August are divided fairly evenly between Sealink shops or offices, rail companies and coach companies. Rail companies however supply the next highest proportion of tickets in November and Sealink shops supply the lowest proportion (apart from other sources). Sealink shops or offices supply proportionally more tickets in February, although the proportion is matched in this survey by rail. In the May survey however, coach companies provide more tickets, after travel agents, and over 10% acquire tickets from other sources.

As on other routes, the November and February surveys have shorter advance booking periods with 50% of passengers not buying tickets until less than 24 hours before sailing (table 7.96). The May survey has the highest proportion of passengers who book more than 3 weeks in advance.

Demographic characteristics

There are more younger passengers in November and February (table 7.97) while the May survey has the most passengers who are over 45 years old. This pattern is repeated in the difference in marital status between surveys (table 7.98) with more single passengers in November and February and the highest proportion of married passengers in May. Although significant differences do exist with respect to income of passengers between surveys (table 7.99), no clear pattern emerges. The May survey does however have the highest proportion of passengers with incomes over £40,000 pa.

7.5   Summary.

The Irish sea ferry passenger market may be summarised as largely consisting of people who are visiting friends and relatives as part of a short holiday. They have used the service before and buy tickets from a travel

Table 7.94: Fishguard-Rosslare foot passengers: how passengers find out about the service

Means of finding out	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Used before	43.3	60.3	52.1	33.3
Travel agent	31.3	20.5	16.7	37.0
Paper ad.	4.5	1.4	6.3	4.9
Other ad.	3.0	2.7	4.2	2.5
Recommendation	9.0	8.2	20.8	7.4
Other	9.0	6.8	0	14.8

Table 7.95: Fishguard-Rosslare foot passengers: where tickets are purchased

Ticket outlet	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
Travel agent	43.3	46.6	35.4	34.1
Sealink shop	16.4	9.6	22.9	19.5
British rail	16.4	28.8	22.9	7.3
Coach company	17.9	8.2	14.6	28.0
Other	6.0	6.8	4.2	11.0

Table 7.96: Fishguard-Rosslare foot passengers: advance purchase time of tickets

Advance purchase time	Survey conducted			
	August 1989	Nov. 1989	Feb. 1990	May 1990
less than 24 hrs	30.2	50.0	52.2	45.1
less than 1 wk	23.8	27.8	23.9	12.7
1-2 weeks	20.6	15.3	13.0	5.6
2-3 weeks	4.8	4.2	10.9	1.4
more than 3wks	20.6	2.8	0	35.2

Table 7.97: Fishguard-Rosslare foot passengers: age

Age of	Survey conducted			
passengers	August 1989	Nov. 1989	Feb. 1990	May 1990
15-24	21.2	30.1	35.4	13.4
25-34	30.3	31.5	29.2	19.5
35-44	22.7	21.9	27.1	14.6
45-54	10.6	8.23	4.2	13.4
55-64	10.6	2.7	4.2	18.3
over 65	4.5	5.5	0	20.7

Table 7.98: Fishguard-Rosslare foot passengers: marital status

Marital	Survey conducted			
status	August 1989	Nov. 1989	Feb. 1990	May 1990
Single	33.8	54.8	56.3	27.2
Married	52.3	32.9	31.3	60.5
Other	13.8	12.3	12.5	12.3

Table 7.99: Fishguard-Rosslare foot passengers: income

Income	Survey conducted			
(£)	August 1989	Nov. 1989	Feb. 1990	May 1990
<5,000	22.0	21.7	21.1	7.7
5-10,000	20.3	26.7	21.1	20.0
10-15,000	11.9	16.7	23.7	16.9
15-20,000	23.7	10.0	23.7	18.5
20-25,000	10.2	5.0	2.6	10.8
25-40,000	8.5	16.7	7.9	9.2
>40,000	3.4	3.3	–	16.9

agent shortly before travel time and are slightly more likely to be travelling with a car. The variables which differ significantly between parts of the market, according to chi-squared are summarised in figure 7.7.

Differences between car and foot passengers

Car passengers are mostly on holiday, combined with a visit to friends or relatives. They spend between 1 and 3 weeks away and travel in family groups of 2-5 persons. They have used the service before and buy tickets from a travel agent. There is a slight predominance of males and the majority of car passengers are married.

In contrast, more foot passengers travel for a holiday only or for other reasons. They spend less time away and more are using the service for the first time. A greater proportion of foot passengers travel alone. They are more likely than car passengers to find out about the service through a recommendation and to use a discount. Foot passengers have a shorter advance purchase time for tickets and there were more younger and also more older passengers among this group.

Differences between routes

Differences between the routes in the ferry market are between the Larne-Stranraer route and the Holyhead-DunLaoghaire and Fishguard-Rosslare routes together, for both car and foot passengers. Car passengers on the Larne-Stranraer route are more likely to travel for business than on the other routes. They spend the least time away and a greater proportion have used the service before. More car passengers travel alone on this route. They tend to buy 60 or 120 hour return tickets from a Sealink shop or office and have a short advance booking time. There are more passengers aged between 25 and 34.

There are more passengers travelling for a combined holiday and visit to

Figure 7.7: Areas of significant difference in the sea passenger market

Level 2
Differences between
Car and Foot passengers

Travel behaviour	Buying behaviour	Demographics
Purpose of journey	Find out about service	Paper frequency
Time spent away	Where tickets purchases	Age
Previous use	Type of ticket	Sex
Arrive at port	Use of discounts	Marital status
Continue journey	Berth purchases	Income
Travel with	Advance purchase time	
Number in group		

Level 3
Differences
between
Routes

Car passengers

Travel behaviour	Buying behaviour
Purpose of journey	Find out about service
Time spent away	Where tickets purchased
Previous use	Type of ticket
	Use of discounts
Demographics	Berth purchases
Age	Advance purchase time

Foot passengers

Travel behaviour	Buying behaviour	Demographics
Purpose of journey	Find out about service	Age
Time spent away	Where tickets purchased	Sex
Previous use	Type of ticket	Marital status
Arrival at port	Use of discounts	Income
Continue journey	Advance purchase time	
Travel with		

Level 4
Seasonal
Differences
or
differences
between
surveys

Larne Stranraer
Travel
Purpose
Time away
Previous use
Travel with
Number in group
Buying
Where purchased
Ticket type
Advance purchase

Holyhead DunLaoghaire
Travel
Purpose
Time away
Travel with
Number in group
Buying
Ticket type
Use of discounts
Advance purchase
Demographics
Age

Fishguard Rosslare
Travel
Purpose
Time away
Previous use
Travel with
Number in group
Buying
Find out
Ticket type
Advance purchase
Demographics
Age

Larne Stranraer
Travel
Purpose
Time away
Arrive at port
Continue journey
Travel with
Buying
Where purchased
Use of discounts
Advance purchase
Demographics
Age
Marital status

Holyhead DunLaoghaire
Travel
Purpose
Time away
Arrive at port
Continue journey
Travel with
Buying
Where purchased
Ticket type
Use of discounts
Advance purchase
Demographics
Age
Marital status
Income

Fishguard Rosslare
Travel
Purpose
Arrive at port
Previous use
Travel with
Buying
Find out
Where purchased
Advance purchase
Demographics
Age
Sex
Marital status
Income

friends or relatives on the Holyhead-DunLaoghaire route and more on holiday only on the Fishguard-Rosslare route. The Fishguard-Rosslare route has the most first time users and fewest passengers travelling alone. Passengers on both routes buy a return ticket for car and passengers from a travel agent. The earliest booking passengers are on the Holyhead-DunLaoghaire route. There are also more passengers aged over 45 on this route.

Foot passengers on the Larne-Stranraer route are more likely to combine a holiday with a visit to friends or relatives or to be travelling on business. They make fewer day trips but more stay away for less than 1 week. Again the highest proportion of repeat users occurs on this route and more find out about the service from a recommendation. They arrive and leave the ports by car and travel on ordinary Sealink foot passenger return tickets which they purchase from a Sealink shop or office shortly before departure. They are younger, more likely to be single and have lower incomes than foot passengers on the other routes.

Foot passengers on the Fishguard-Rosslare route spend more time away and arrive at and leave the ports by bus. They purchase tickets from a coach company and are older. Passengers on the Holyhead-DunLaoghaire route make the connection to and from the ferry by rail and book their tickets earlier than on the other routes.

Differences between surveys

Car passengers on the Larne-Stranraer route in August continue to visit friends or relatives as part of a holiday, They spend longer away and travel in family groups. In November more car passengers travel alone for business. They spend only a short time away and buy 60 or 120 hour return tickets from a Sealink shop shortly before departure. The February survey is influenced by a Football match in Glasgow. Passengers in February spend the least time away, travel with friends in larger groups and are the most likely to have used the service before. Car passengers in May book tickets

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longer in advance. They are travelling alone for a short holiday, without a visit to friends or relatives.

More foot passengers on the Larne-Stranraer route not visiting friends or relatives travel in August. They spend longer away and make connections to and from the ferry by rail. They are the least likely of foot passengers on this route to travel alone. Foot passengers in November travel for a variety of reasons. They spend less time away, arrive at the port either by bus or in a car and continue their journey in a car. Passengers in February also spend less time away, more travel for business and are given a lift in a car to the ferry and continue their journey by rail. There are also more younger and single foot passengers travelling with friends and book tickets later than in other surveys on this route.

On the Holyhead-DunLaoghaire route car passengers in August are on holiday combined with a visit to friends or relatives. They travel in larger family groups and spend more time away. In November more passengers travel for business and alone. They book later and tend to be younger. There are again more car passengers travelling for business in February. They spend the least time away, book later and take advantage of more discounts or special offer tickets such as the motorist weekend excursion. There are more older car passengers in May who also use discounts but are more likely to travel for a holiday only.

Foot passengers on the Holyhead-DunLaoghaire route on both the August and November surveys combine a holiday with a visit to friends or relatives. They make more day trips than passengers in February or May and arrive at and leave the ports by rail. Passengers in November have shorter advance booking times and also lower incomes. In February passengers also use rail to continue their journey but they travel for other reasons. Passengers in May differ from those at other times of the year in that they are on holiday only and spend longer away. They arrive at the ferry and continue their journey by bus and buy tickets from a coach company. They also tend to

be older and have higher incomes.

On the Fishguard-Rosslare route car passengers are again combining a holiday and visit to friends or relatives in August. More are first time users, travel with their family and found out about the service from a travel agent or from a recomendation. More passengers in November travel for business and other reasons. They spend least time away and have the shortest advance purchase time for tickets. Car passengers in February also travel for business and other reasons. More however travel alone and spend more time away. In May there are again more first time users but more are on holiday only.

Foot passengers in August, November and February on the Fishguard-Rosslare route visit friends and relatives as a holiday. There are slightly more first time users in August. They travel with their family and find out about the service and buy their tickets from a travel agent. There are more foot passengers travelling alone in November and February. Passengers in these months also tend to book later and they are younger. In contrast, foot passengers in May travel for a holiday only. They travel with their family and are orientated towards bus or coach companies as the means of arriving at and leaving the ports, and type of tickets purchased. They book earlier than at other times of the year, are older, more are married and have higher incomes.

From this analysis it appears that not only do the levels of passenger carryings fluctuate seasonally but the type of passenger also varies. The

- purpose of journey

- who the passenger is traveling with

- advance purchase time for tickets

show seasonal variation on all routes for both car and foot passengers. Furtther analysis should consider using one (or more) of these as a base for a

priori segmentation. This preliminary analysis has only begun to tap the wealth of the relationships existing in these survey data. Throughout the chapter questions have been raised which may be answered by dividing the market using different criteria.

Chapter 8

Preliminary analyses of air passenger survey data

The objective of this chapter is to provide an understanding of the air passenger market and identify key areas of difference between the constituent parts of this market. As in the previous chapter a strict sequence of analyses is followed. The air market is evaluated in the context of:

- the overall profile of the air market

- differences between business and non-business passengers

- differences between airports

- seasonal differences between passengers at airports.

A total of 2033 (R=78.4%) passengers returned useable questionnaires in the airport surveys; 901 (R=75.1%) from Belfast International, 692 (R=86.7%) from Belfast City and 440 (R=73.9%) from Dublin airport.

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8.1 Overall profile of Air passengers.

Travel behaviour

In contrast to the ferry market, the main reason for travel in the air market is business. The reasons for travel in the air market are presented in table 8.1, figures from the overall profile for ferry passengers are included in the tables presented in this section for comparison. Less than a quarter of air passengers combine a holiday with a visit to friends or relatives and only 5% are travelling solely for a holiday. The length of time air passengers spend away (table 8.2) appears to be slightly shorter than for ferry passengers with over half of air passengers being away for less than one week and almost one quarter spending less than 24 hours away. The most widely used means of arrival at the airport is car (table 8.3), either the passenger's own car or a lift in another car. Car again is the most common means of leaving the destination airport, but rail is also used by 18% of passengers, presumeably Heathrow passengers travelling into London on the Tube.

The majority of air passengers travel alone (table 8.4), with only 10% in groups or three, or more and 20% in groups of two persons. In common with ferry passengers, approximately three-quarters of the passengers are repeat users (table 8.5), although in this instance the three-quarters refers to passengers who have used an air service between Great Britain and Ireland at least once in the past twelve months. Less than a quarter of air passengers have used a ferry service between Great Britain and Ireland in the same time period. This implies that there may only be a relatively small proportion of air passengers who might use a ferry service in the future, based on past use. This is not encouraging for ferry opertors attempting to increase market share *vis a vis* airline operators.

Table 8.1: All air passengers: purpose of journey

Purpose of Journey	Ferry %	Air %
Holiday and VFR	46.6	23.9
Holiday only	23.5	5.0
Business	15.2	60.9
Other	14.8	10.2

Table 8.2: All air passengers: period of time spent away

Time period	Ferry %	Air %
Less than 24 hours	4.1	21.7
Less than 1 week	48.2	54.0
1-2 weeks	31.6	12.8
2-3 weeks	7.6	4.0
More than 3 weeks	8.4	7.5

Table 8.3: All air passengers: means of arriving at and leaving airports

Mode of arrival and departure	Arrive %	Leave %
Bus	5.7	8.2
Rail	1.4	18.5
Own car	33.9	27.4
Lift in car	35.6	23.4
Taxi	16.5	11.6
Other	6.8	11.0

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Table 8.4: All air passengers: who passengers are travelling with

Who passenger's are travelling with	Ferry %	Air %
Alone	24.2	69.5
Family	46.9	13.8
Friends	22.5	10.7
Family and friends	6.0	0.4
Colleagues	0.4	5.6

Table 8.5: All air passengers: previous use of service

No. times used in past 12 months	Air %
0	25.3
1-5	44.8
6-10	14.7
11-20	4.7
more than 20	25.3

Buying behaviour

Compared with ferry passengers, a slightly lower proportion of air passengers find out about the service through previous use (table 8.6), despite the high proportion of repeat users. A higher proportion however find out about the service through a travel agent and about the same proportion learn of the service through a recommendation. The majority of passengers purchase tickets from a travel agent (table 8.7) and a higher proportion of air passengers take advantage of a discount or ticket concession. The discount structure in the air market is much more complicated than in the ferry market, with each airline having its own fare structure. One of the more common discounts is some form of 'APEX' or other advance booking requirement. The advance booking requirement may be reflected in the slightly longer advance purchase time of tickets (table 8.8), although a significant proportion of passengers still purchase tickets less than 24 hours in advance.

Demographic characteristics

The air market contains more passengers in the 25-34, 35-44 and 45-54 age groups (figure 8.1), but fewer older passengers. They are predominantly male (table 8.9) and the majority are married (table 8.10). The income distribution of air passengers is very different from that for ferry passengers which is biased towards lower incomes. In contrast, the income profile for air passengers (figure 8.2) is very obviously skewed towards higher income passengers with 35% having an income over £25,000 and only 7% have an income under £5,000. The lower proportion of passengers with an income between £20,000 and £25,000 in both the ferry and air surveys may be attributable to an inappropriate choice of income categories.
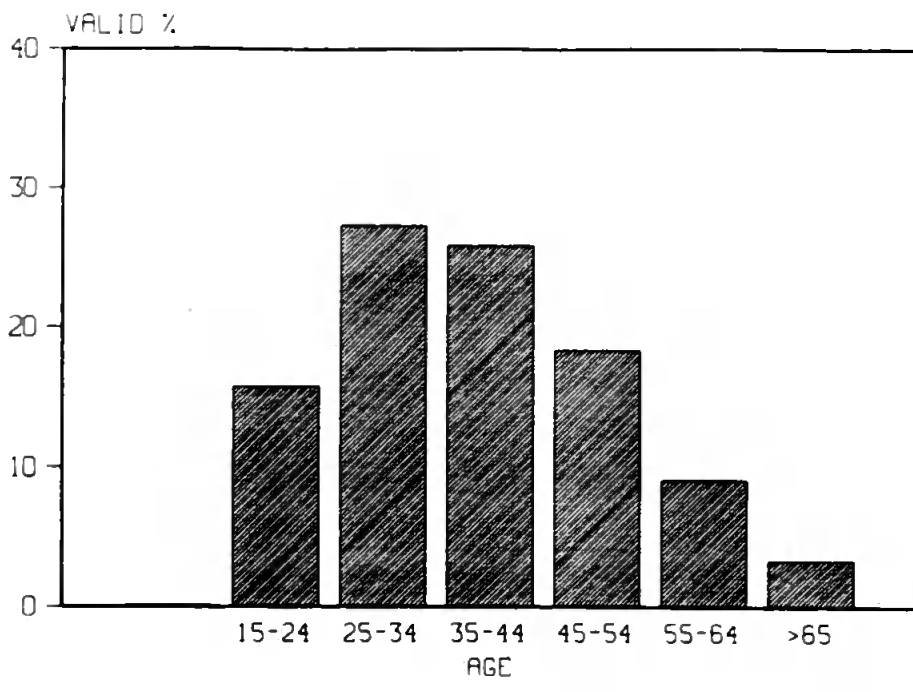
Figure 8.1: Age profile for all air passengers
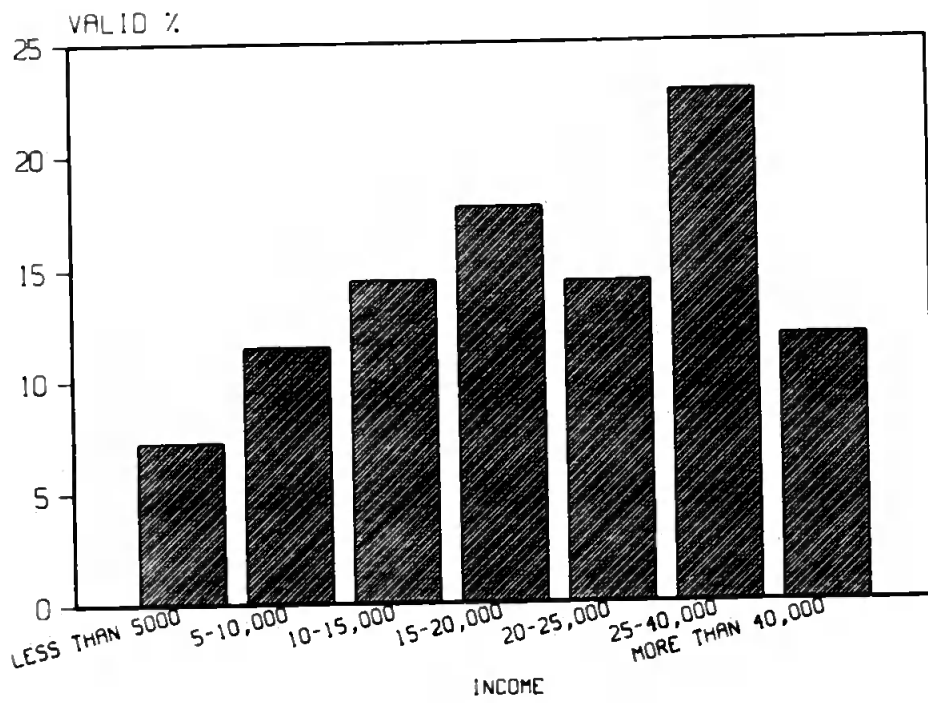
Figure 8.2: Income profile for all air passengers

Table 8.6: All air passengers: how passengers find out about the service

Means of finding out	ferry %	Air %
Used before	63.1	52.0
Travel agent	19.1	28.5
Paper or magazine	2.3	2.2
Other advertising	1.4	1.7
Recommendation	9.0	9.6
Other	5.1	6.1

Table 8.7: All air passengers: where tickets are purchased

Type of ticket outlet	Ferry %	Air %
Travel agent	51.7	71.2
Sealink/airport	26.0	14.9
British Rail	9.1	n/a
Coach company	5.3	n/a
Other	8.1	13.8

Table 8.8: All air passengers: advance purchase time of tickets

Time before travel	Ferry %	Air %
Less than 24 hours	32.4	19.8
Less than 1 week	22.8	32.2
1-2 weeks	16.8	21.8
2-3 weeks	7.7	12.5
More than 3 weeks	20.2	13.7

Table 8.9: All air passengers: sex of passengers

Sex	Ferry %	Air %
Male	56.2	72.2
Female	43.8	27.2

Table 8.10: All air passengers: marital status

Marital status	Ferry %	Air %
Single	35.1	33.5
Married	57.4	60.7
Other	7.5	5.8

8.2 Differences between business and non-business passengers.

The air market is also divided into two main groups of passengers:

1. those travelling for business (61% of passengers surveyed)

2. those travelling for other reasons, mainly for holidays.

It should be remembered that all the airport surveys took place on a weekday which will undoubtedly have influenced the results.

Travel behaviour

Half the business passengers in the sample fly from Belfast International airport (table 8.11), which is the only airport with proportionally more business than non-business traffic. More business passengers than non-business fly to Birmingham, Blackpool, East Midlands, Glasgow, London Heathrow and Manchester airports.

As expected, a higher proportion of business passengers spend less than 24 hours away (table 8.12). However, roughly equal proportions of business and non-business passengers are away for less than one week. Relatively few business travellers are away for more than one week in contrast to the proportion of non-business travellers. More business travellers tend to arrive at the airport in their own car, taxi or some other means (table 8.13), while

Table 8.11: Business and non-business passengers: airport flown from

Airport	Non-business %	Business %
Belfast City	38.7	30.7
Belfast International	33.6	51.5
Dublin	27.7	17.8

proportionally more non-business travellers use bus or rail or are given a lift in someone else's car. The same pattern is found for the means of leaving the airport (table 8.14), although a higher proportion of business passengers use rail to continue their journey.

Both groups in the air market remain dominated by passengers travelling alone (table 8.15), although the proportion is higher for business passengers as opposed to non-business passengers. The remaining business passengers either travel with friends or colleagues. More non-business passengers travel with another member of their family. Almost all passengers who are not travelling alone travel with only one other person. The main difference between the two groups remains the higher proportion of business passengers who are travelling alone and the higher proportion of non-business passengers travelling with one other person. Business passengers travel more frequently (table 8.16), although a higher proportion of non-business passengers have made between one and five journeys between Great Britain and Ireland by air in the past 12 months. Business passengers travel more frequently than this.

Buying behaviour

Less than half the non-business passengers find out about the service through previous use (table 8.17), as opposed to a majority of business passengers. A higher proportion of non-business passengers find out about the service from a travel agent. Almost 18% of non-business passengers however learnt of the

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Table 8.12: Business and non-business passengers: period of time spent away

Time period	Non-business %	Business %
Less than 24 hours	3.7	34.0
Less than 1 week	54.4	53.7
1-2 weeks	24.7	4.6
2-3 weeks	6.8	2.2
More than 3 weeks	10.5	5.4

Table 8.13: Business and non-business passengers: means of arriving at the airport

Means of arriving	Non-business %	Business %
Bus	8.8	3.5
Rail	2.4	0.8
Own car	25.1	39.3
Lift in car	46.5	29.3
Taxi	11.3	19.7
Other	6.0	7.4

Table 8.14: Business and non-business passengers: means of continuing the journey

Means of arriving	Non-business %	Business %
Bus	13.0	4.8
Rail	20.1	17.2
Own car	13.7	36.8
Lift in car	34.0	17.0
Taxi	10.6	12.3
Other	8.7	11.8

Table 8.15: Business and non-business passengers: who passengers are travelling with

Who passenger's are travelling with	Non-business %	Business %
Alone	56.7	78.3
Family	29.5	3.1
Friends	11.9	10.0
Family and friends	0.9	0.1
Coleagues	0.9	8.5

Table 8.16: Business and non-business passengers: previous use of GB to Ireland air service

Number of times in past 12 months	Non-business %	Business %
1-5	82.3	48.4
6-10	12.2	23.4
11-20	5.1	18.8
over 20	0.2	9.4

service from a recommendation. Slightly more non-business passengers than business passengers buy their tickets from a travel agent (table 8.18). For the business passenger this probably includes ticket purchases from a travel agent by their company. Eighteen per cent of business passengers purchase or obtain tickets from somewhere other than a travel agent or an airline desk at the airport. Most of these other sources of tickets are the companies or employers of the passengers. Just over half the non-business passengers, but only a quarter of business passengers take advantage of a ticket discount or concession. Again the range of discounts used is extremely diverse with many passengers having their own interpretation of what the discount consisted.

The advance purchase time of tickets also differs between business and non-business passengers (table 8.19). Business passengers tend to purchase tickets later, almost one-quarter do not buy their ticket until less than 24 hours before travel and 41% buy tickets less than one week before travel. In contrast, the majority of non-business passengers buy tickets at least one week before travelling with more than a quarter buying tickets more than three weeks ahead of travel time.

Demographic characteristics

Non-business passengers tend to be younger and older (figure 8.3) than business passengers who are predominantly in the age ranges 35-44 and 45-54 years old (figure 8.4). Despite male passengers dominating the air market overall, when the distinction is made between business and non-business passengers, it is evident that this domination stems from the business passengers (table 8.20), which concurs with Shaw's (1985) description of business air travellers. In contrast, non-business passengers exhibit almost equal proportions of males and females. Business passengers are again predominantly married (table 8.21) but more passengers travelling for non-business reasons are single. Non-business passengers predominate in the low income groups, up to £15,000 (figure 8.5) and business passengers predominate above this

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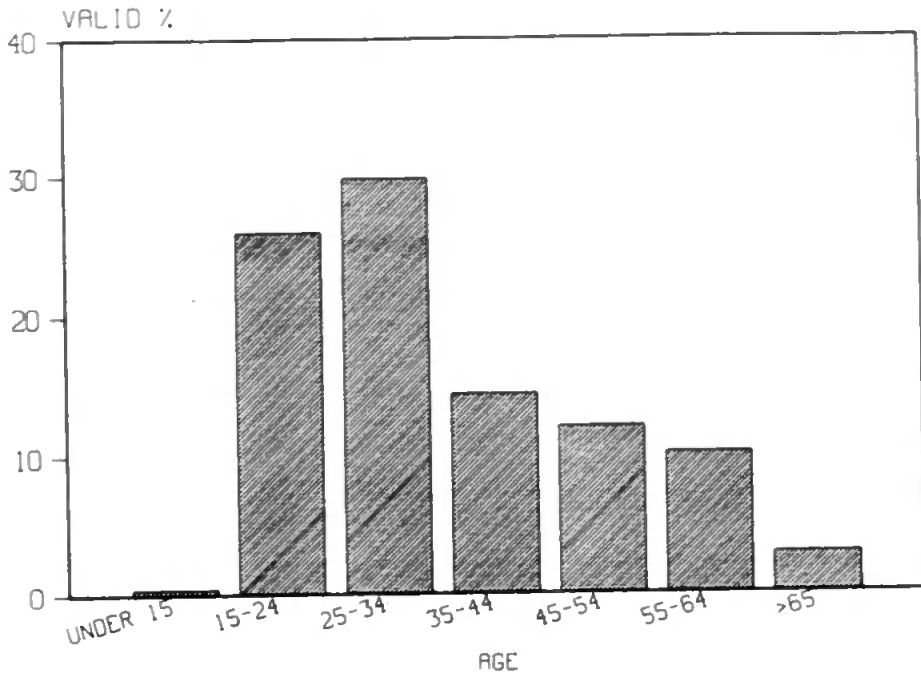
Figure 8.3: Age profile for non-business passengers

level (figure 8.6).

Table 8.17: Business and non-business passengers: how passengers found out about the service

Means of Finding out	Non-business %	Business %
Used before	43.0	57.7
Travel agent	30.7	26.8
Paper or magazine	2.9	1.4
Other advertising	2.3	1.4
Recommendation	17.6	4.7
Other	3.5	8.0
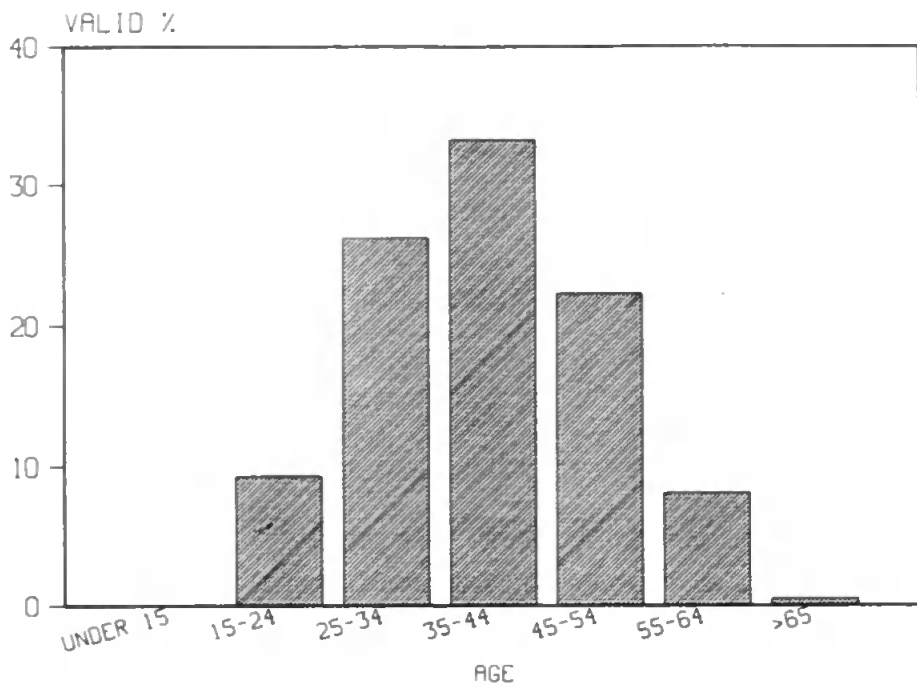
Figure 8.4: Age profile for business passengers
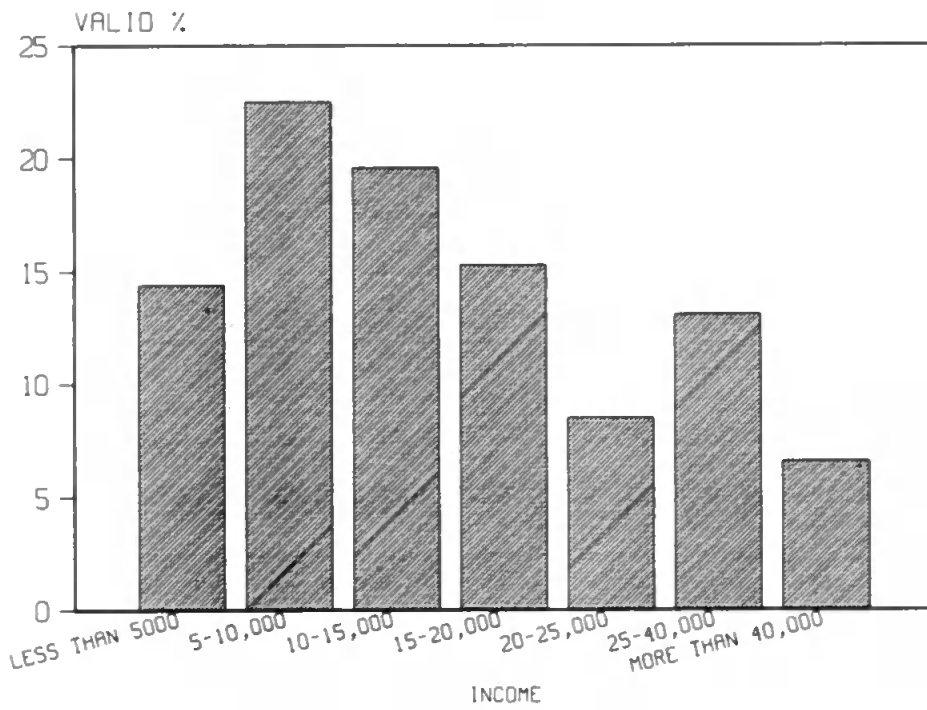
Figure 8.5: Income profile for non-business passengers

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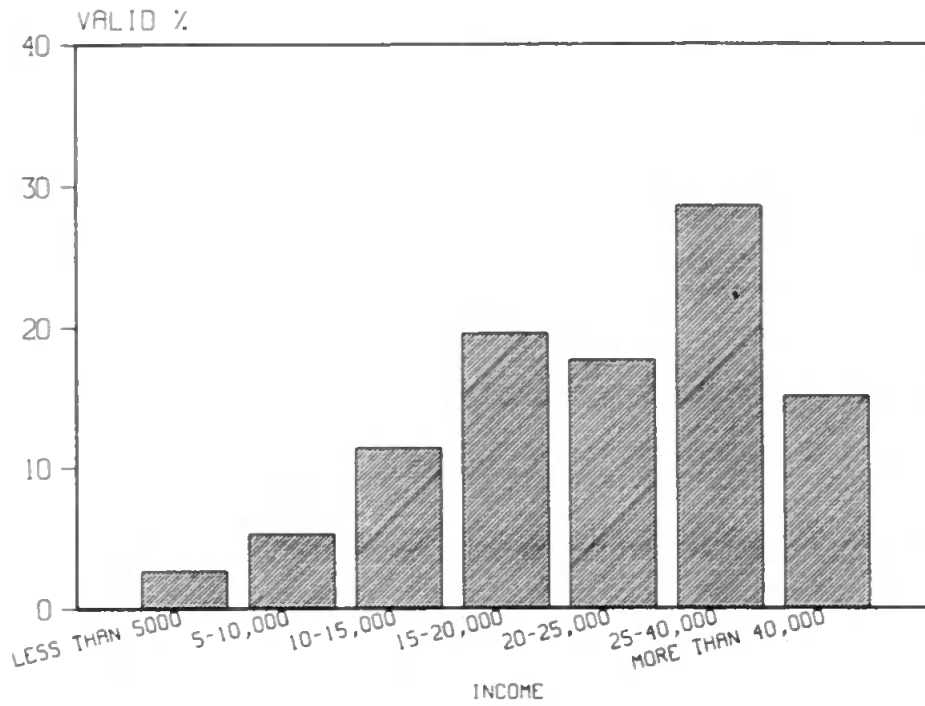
Figure 8.6: Income profile for business passengers

Table 8.18: Business and non-business passengers: where tickets are pur-
chased

Type of ticket outlet	Non-business %	Business %
Travel agent	75.3	68.2
Airine desk	15.8	14.5
Other	8.9	17.2

Table 8.19: Business and non-business passengers: advance purchase time
of tickets

Time before travel	Non-business %	Business %
Less than 24 hours	15.9	22.3
Less than 1 week	19.6	41.1
1-2 weeks	20.5	22.6
2-3 weeks	17.2	9.0
More than 3 weeks	26.8	5.0

Table 8.20: Business and non-business passengers: sex of passengers

Sex	Non-business %	Business %
Male	49.3	87.3
Female	5.7	·12.7

Table 8.21: Business and non-business passengers: marital status

Marital status	Non-business %	Business %
Single	49.6	23.4
Married	43.3	71.8
Other	7.0	4.8

8.3 Differences between airports

8.3.1 Differences between airports for business passengers.

Very few differences are encountered between the airports surveyed for business passengers, suggesting greater homogeneity among business passengers. Areas where differences did occur are:

- means of arrival and departure from airports,

- how the passengers find out about the service

- where the tickets are purchased and,

- income.

Travel behaviour

A small proportion of business passengers use bus to arrive at Belfast International and Dublin airports (table 8.22) but the main difference between

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the airports is the greater proportion of passengers at Belfast International airport who use their own car to arrive at the airport and more passengers who use taxis at Dublin airport. A passenger's own car is the most commonly used way of leaving the destination airport (table 8.23). This proportion is highest amongst passengers who fly from Belfast City airport. The proportions of business passengers using differing forms of transport to reach and leave the airports implies that business passengers who are normally resident in Northern Ireland use Belfast International airport and Belfast City airport is used by passengers normally resident outside Northern Ireland. Rail is the second most used form of transport by business passengers who fly from Belfast International and Dublin airports. As before, this is presumeably due to London Heathrow and London Gatwick passengers using either the 'Tube' or the Gatwick rail link to travel into London. It is noticeable that among passengers who flew from Belfast City airport, which does not operate a service to either Heathrow or Gatwick, only 5% of passengers use rail, although a higher proportion used taxis, to continue their journey.

Buying behaviour

The proportion of passengers finding out about the service through previous use (table 8.24), although dominant at all airports, is highest at Belfast International airport and lowest at Dublin. Correspondingly, a greater proportion of passengers who fly from Dublin airport learn of the service from a travel agent. A higher proportion of passengers at Belfast City airport learn of the service by recommendation. This point is worth considering by the airport management.

The main difference between airports in where passengers purchase tickets (table 8.25) is the lower proportion of passengers at Belfast International airport who buy tickets from a travel agent. This appears to be compensated for by a higher proportion of passengers at this airport who obtain tickets from somewhere other than a travel agent or airline desk. Presumeably the

Table 8.22: Business passengers: means of arriving at the airport

Time spent away	Belfast City %	Belfast International %	Dublin %
Bus	0.5	4.4	5.7
Rail	1.4	0	0
Own car	34.9	44.8	31.1
Lift in car	32.4	30.4	20.6
Taxi	24.8	13.1	29.7
Other	6.0	6.8	12.0

Table 8.23: Business passengers: means of continuing the journey

Time spent away	Belfast City %	Belfast International %	Dublin %
Bus	6.0	4.1	4.9
Rail	5.4	23.3	20.2
Own car	45.0	32.3	35.5
Lift in car	20.4	16.7	11.8
Taxi	16.9	9.9	11.3
Other	6.2	13.4	16.3

majority of these passengers obtain tickets from their company or employer, but it is possible that some may be services personnel travelling on a HMF travel warrent.

Demographic characteristics

The difference in income profiles between the airports (table 8.26) appears to be that Dublin airport has a higher proportion of higher income passengers.

Table 8.24: Business passengers: how passengers find out about the service

How the passenger finds out about the service	Belfast City %	Belfast International %	Dublin %
Used before	52.5	64.2	47.8
Travel agent	27.5	23.5	35.4
Paper/magazine ad.	1.6	1.1	1.9
Other advertisement	1.9	0.8	1.9
Recommendation	8.2	2.5	4.8
Other	8.2	7.9	8.1

Table 8.25: Business passengers: where tickets are purchased

Type of ticket outlet	Belfast City %	Belfast International %	Dublin %
Travel agent	72.7	64.7	70.8
Airport	13.9	14.1	17.0
Other	13.4	21.2	12.3

Table 8.26: Business passengers: income

Income (£)	Belfast City %	Belfast International %	Dublin %
<5,000	3.7	2.1	2.7
5-10,000	4.0	6.2	4.9
10-15,000	12.3	11.8	8.6
15-20,000	21.8	19.5	13.5
20-25,000	20.1	17.1	15.1
25-40,000	26.9	28.5	31.9
>40,000	11.2	14.8	23.2

8.3.2 Differences between airports for non-business passengers.

Travel behaviour

Despite using purpose of journey to divide the market into two main groups, variation still exists within the non-business group with respect to purpose of travel (table 8.27). There are a higher proportion of passengers at Belfast City airport who combine a visit to friends or relatives with a holiday. Dublin airport has the highest proportion of passengers who are on holiday only. The highest proportion of passengers travelling for other reasons fly from Belfast International airport.

Passengers using the different airports spend varying periods of time away (table 8.28). Belfast City airport has the highest proportion of passengers spending less than one week away. There are a lower proportion of passengers spending less than 1 week away and 1-2 weeks away, but more spending more than 3 weeks away at Belfast International airport.

A lift in a car is the predominant means of arriving at each of the airports (table 8.29), the proportion is highest at Belfast City airport, and lowest at Dublin airport. More passengers at Dublin use a bus to reach the airport. The proportion of passengers who use their own car to reach Belfast International airport is higher than for the other two airports. As for business passengers, a greater proportion of passengers use rail to continue their journey and as before fewer passengers who fly from Belfast City airport continue their journey by rail (table 8.30). A lift in a car is the most common means of leaving the destination airport; the proportion is highest for Belfast City passengers and lowest for passengers at Belfast International airport. A greater proportion of passengers at Belfast International and Dublin airports use other modes of transport, including air, to continue their journey implying that the journey does not finish in the GB.

The majority of non-business passengers travel alone (table 8.31), the pro-

Table 8.27: Non-business passengers: purpose of journey

Purpose of journey	Belfast City %	Belfast International %	Dublin %
Holiday/vfr	67.0	58.1	56.8
Holiday only	8.1	10.5	22.1
Other	24.9	31.4	21.1

Table 8.28: Non-business passengers: time spent away

Time away	Belfast City %	Belfast International %	Dublin %
Less than 24 hours	4.7	4.7	0.9
Less than 1 week	58.9	49.4	54.0
1-2 weeks	25.6	22.2	26.5
2-3 weeks	4.4	10.1	6.2
More than 3 weeks	6.4	13.6	12.3

portion is highest at Belfast International airport. Passengers at Dublin airport are more likely to travel with either family or friends. Of those passengers not travelling alone, there are a higher proportion of passengers who travel in groups of two or three passengers at Dublin airport (table 8.32).

Buying behaviour

Belfast International airport has the highest proportion of repeat users (table 8.33), over half the passengers know about the service through previous use. The proportion of passengers who find out about the service from a travel agent is highest at Dublin airport. A significant proportion of passengers at Belfast City airport learn of the service through a recommendation as in the case for business passengers at this airport.

The advance purchase time (table 8.34) for tickets differs between the air-

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Table 8.29: Non-business passengers: means of arriving at the airport

Transport mode	Belfast City %	Belfast International %	Dublin %
Bus	1.3	9.4	18.6
Rail	4.0	0.8	1.9
Own car	24.9	31.0	18.1
Lift in car	51.2	49.4	36.2
Taxi	17.2	4.7	11.0
Other	1.3	4.7	14.3

Table 8.30: Non-business passengers: means of continuing the journey

Transport mode	Belfast City %	Belfast International %	Dublin %
Bus	13.7	12.0	13.3
Rail	13.0	25.1	24.1
Own car	14.3	14.7	11.3
Lift in car	42.3	26.7	31.0
Taxi	11.3	8.0	9.9
Other	3.4	13.5	10.3

Table 8.31: Non-business passengers: who passengers travel with

Travel group	Belfast City %	Belfast International %	Dublin %
Alone	59.6	61.6	46.7
With family	27.6	24.7	38.1
With friends	10.4	12.2	13.8
Family and friends	0.7	0.8	1.4
Colleages	1.7	0.8	0

Table 8.32: Non-business passengers: number in travel group

Number in group	Belfast City %	Belfast International %	Dublin %
1	60.0	62.8	48.3
2	28.1	30.4	39.6
3	5.1	2.4	5.3
4	3.4	2.4	2.9
5	1.4	0.8	1.9
6-10	1.0	0	1.9
over 10	1.0	1.2	0

ports. Dublin airport has more early booking passengers, 40% book tickets more than 3 weeks in advance and the proportion of passengers declines in sucessively shorter time periods, leaving only 11.5% who book tickets less than 24 hours in advance. The advance booking period at Belfast International airport is well spread with about 20% of passengers in each time period. At Belfast City airport a higher proportion of passengers book tickets less than 1 week and 1-2 weeks in advance.

Demographic characteristics

The age profiles for non-business passengers also differ between (table 8.35) airports. Belfast City airport has higher proportions of passengers aged between 15-24 and 25-34 years old. There are proportionally more passengers aged between 35-44 and also over 65 years old at Belfast International airport while Dublin has more passengers in the 45-54 and 55-64 years age categories.

Table 8.33: Non-business passengers: how passengers find out about the service

How the passenger finds out about the service %	Belfast City %	Belfast International %	Dublin %
Used before	35.0	55.8	38.7
Travel agent	27.9	25.5	41.2
Paper/magazine ad.	4.1	2.4	2.0
Other advertisement	4.8	0.8	0.5
Recommendation	25.2	12.4	13.2
Other	3.1	3.2	4.4

Table 8.34: Non-business passengers: advance purchase time of tickets

Time spent away	Belfast City %	Belfast International %	Dublin %
Less than 24 hours	16.3	19.0	11.5
Less than 1 week	24.1	19.0	13.9
1-2 weeks	22.4	21.3	16.8
2-3 weeks	14.3	20.6	17.3
More than 3 weeks	22.8	20.2	40.4

Table 8.35: Non-business passengers: age

Age	Belfast City %	Belfast International %	Dublin %
<15	0	0	1.4
15-24	27.7	25.7	24.1
25-34	32.8	28.4	27.4
35-44	14.2	17.5	10.8
45-54	10.1	12.5	14.2
55-64	7.8	7.4	16.5
>64	7.4	8.6	5.7

Table 8.36: Business passengers at Belfast City airport: arrival at airport

Transport mode	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Bus	1.3	1.0	–	–
Rail	1.3	–	3.7	–
Own car	31.6	27.3	33.9	48.2
Lift in car	43.4	33.3	29.4	25.3
Taxi	11.8	29.3	28.4	26.5
Other	10.5	9.1	4.6	—

8.4 Seasonal differences at airports

In general, there are few seasonal differences in the air market. No differences at all are found between surveys for business passengers at Belfast International airport, nor are there any differences between non-business passengers at Dublin airport.

8.4.1 Seasonal differences among business passengers at Belfast City airport

Business passengers at Belfast City airport only differ between surveys with respect to means of arriving at and leaving the airport.

More passengers use their own car to arrive at the airport in June (table 8.36), perhaps indicating higher numbers of Northern Ireland residents travelling. This is possible as the June survey is conducted at the beginning of the week, Monday/Tuesday, as opposed to the Thursday/Friday for the other surveys. This premise is supported by the higher numbers, (over 50%) of passengers in December and March who use their own car to continue their journey, suggesting they are resident in GB.

Table 8.37: Business passengers at Dublin airport: means of arriving at the airport

Transport mode	March 1990 %	June 1990 %
Bus	5.3	6.3
Rail	0.9	1.0
Own car	40.7	19.8
Lift in car	20.4	20.8
Taxi	26.5	33.3
Other	6.2	18.8

8.4.2 Seasonal differences among business passengers at Dublin airport.

The timing of the surveys at Dublin airport may also have produced the differences between the March and June surveys (these were the only surveys conducted at Dublin airport). The survey in March was conducted on a Monday and Tuesday when business travellers resident in Ireland may be travelling to GB at the beginning of the week over 40% of business passengers in March arrive at the airport in their own car (table 8.37). The other survey in June was conducted on a Thursday and Friday when GB resident business passengers may have been returning home for the weekend and in this survey more passengers arrived by taxi.

8.4.3 Seasonal differences among non-business passengers at Belfast City airport

Belfast City airport appears to exhibit more seasonality compared with the other two airports. A relationship is found to exist between season and:

- purpose of journey,

- time spent away,

- who the passenger is travelling with,

- how passengers find out about the service and,

- the advance purchase time of tickets.

Travel behaviour

The main difference in purpose of journey between surveys (table 8.38) appears to lie with the survey conducted in December when 40% of passengers travelled for reasons other than a holiday. Possible reasons for travel include shopping. Further investigation could concentrate on identifying this sizeable group, where they are flying to, where do they live and size of travel group etc. There are also slightly more passengers travelling solely for the purposes of a holiday in September. More passengers in December and March are away for less than 1 week (table 8.39), following the pattern established in the ferry surveys. No non-business passengers spend more than 3 weeks away in March and more are away for 1-2 weeks in September. A lower proportion of passengers travel alone in September (table 8.40) and more with friends in March.

Buying behaviour

The proportion of passengers who know about the service through previous use is lowest in September (table 8.41) and highest in June. This may suggest that when the first survey is conducted in September more passengers are using the service, and perhaps the airport, for the first time but by the time the last survey is conducted in June, the airport and services are better established and attracting more repeat users. The proportion of passengers who find out about the service from a travel agent is higher in the first two surveys.

Again following the general pattern of the ferry market, the proportion of passengers who purchase tickets less than 24 hours before departure is higher

Table 8.38: Non-business passengers at Belfast City airport: purpose of journey

Purpose of journey	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Holiday/vfr	70.0	56.3	73.4	68.3
Holiday only	12.5	2.8	9.4	7.3
Other	17.5	40.8	17.2	24.4

Table 8.39: Non-business passengers at Belfast City airport: time spent away

Time away	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Less than 24 hrs	5.0	8.5	4.7	1.2
Less than 1 week	42.5	70.4	71.9	54.9
1-2 weeks	40.0	12.7	18.8	28.0
2-3 weeks	5.0	0	4.7	7.3
More than 3 weeks	7.5	8.5	0	8.5

in December (table 8.42), and also slightly higher in March. The earliest booking survey is conducted in September. In retrospect, the use of two weeks as a boundary between booking periods may have been less than ideal as there are several discounts which involve booking the ticket two weeks in advance. If a ticket is booked on the time limit to qualify for the discount, whether this is perceived as 1-2 weeks or 2-3 weeks will have depended on the individual.

8.4.4 Seasonal differences among non-business passengers at Belfast International airport

The length of time spent away and mode of travel for leaving the destination airport are the only variables to differ significantly between the surveys for

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Table 8.40: Non-business passengers at Belfast City airport: who passengers are travelling with

Travel with	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Alone	47.5	67.6	59.4	64.6
Family	40.0	25.4	17.2	25.6
Friends	11.3	7.03	17.2	7.3
Other	1.3	0	6.3	2.4

Table 8.41: Non-business passengers at Belfast City airport: how passengers find out about the service

Find out through	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Previous use	21.8	36.6	38.1	43.9
Travel agent	32.1	35.2	19.0	24.4
Paper/Mag ad.	5.1	4.2	0	6.1
Other advert	11.5	2.8	3.2	1.2
Recommendation	29.5	19.7	28.6	23.2
Other	0	1.4	11.1	1.2

Table 8.42: Non-business passengers at Belfast City airport: advance purchase time of tickets

Advance purchase time	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Less than 24 hrs	12.7	26.8	16.1	11.0
Less than 1 week	26.6	22.5	25.8	22.0
1-2 weeks	19.0	28.2	19.4	23.2
2-3 weeks	10.1	11.3	12.9	22.0
More than 3 weeks	31.6	11.3	25.8	22.0

Table 8.43: Non-business passengers at Belfast International airport: time spent away

Time away	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Less than 24 hrs	3.2	4.8	8.8	1.6
Less than 1 week	31.7	56.5	55.9	53.1
1-2 weeks	30.2	19.4	17.6	21.9
2-3 weeks	17.5	3.2	4.4	15.6
More than 3 weeks	17.5	16.1	13.2	7.8

non-business passengers at Belfast International airport.

Fewer passengers spend less than one week away in September (table 8.43) but, proportionally more passengers in September spend more than one week away than on the surveys conducted at other times of the year. In June only 8% of passengers spend more than 3 weeks away compared with 13% and over on the other surveys.

The differences between surveys in the transport modes used to leave the destination airport are likely to have been influenced by differing proportions of passengers who flew to certain airports i.e., those with a rail connection. In the surveys conducted in March and June an effort is made to slightly increase the proportion of passengers who are who fly to non-London airports. The fall in the proportion of passengers using rail (table 8.44) to continue their journey in March and June may be a reflection of this. Another difference between the surveys conducted in September and December and those conducted in March and June is the greater proportion of passengers who continue their journey in their own car in September and December but more passengers are given a lift in a car in March and June.

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Table 8.44: Non-business passengers at Belfast International airport: means of continuing the journey

Transport mode	September 1989 %	December 1989 %	March 1990 %	June 1990 %
Bus	7.9	6.6	24.2	8.2
Rail	28.6	31.1	19.7	21.3
Own car	17.5	23.0	10.6	8.2
Lift in car	23.8	21.3	27.3	34.4
Taxi	6.3	4.9	7.6	13.1
Other	15.9	13.1	10.6	14.8

8.5 Summary.

The air passenger market can be summarised as composed of male business travellers who spend less than one week on a trip. They tend to travel alone, are mainly repeat users and purchase their tickets from a travel agent. Air passengers appear to be aged between 25 and 44 and have higher incomes than ferry passengers.

Business passengers spend less time away than non-business passengers. They arrive at the airport and continue the journey either in their own car or in a taxi. They usually travel alone, more frequently and purchase tickets later than non-business passengers. They are predominantly male and fall into a narrow age range and tend to have a higher income. Passengers not travelling for business are given a lift to and from the airports and more travel with their family. More non-business passengers buy tickets from a travel agent and use more discounts than business passengers.

Very few differences exist between the airports for business passengers, suggesting a high degree of homogeneity in this part of the market. This has serious implictions for the marketing policies of all three airports. If no way can be found to differentiate passengers at one airport from those at another, it may not be possible to target particular passengers successfully.

An advertising campaign, for example, at one airport may also influence passengers at another airport. While this may be beneficial to the airport mounting the campaign, it is less likely to be advantageous for the other airports. Therefore, airports should be aware of the potential impact which their competitor's advertising and other marketing activities may have.

More passengers at Belfast City airport continue the journey in their own car and are more likely to have found out about the service through a recommendation. The role of recommendation has been important in the development of this young but rapidly growing airport. In contrast, more passengers at Belfast International airport arrive at the airport in their own car. They are also the most likely to have used the service before. This is to be expected as Belfast International airport is the older established airport in Northern Ireland. More business passengers at Dublin airport arrive by taxi, find out about the service from a travel agent and have higher incomes than at the other airports.

Non-business passengers at Belfast City airport tend to combine a holiday with a visit to friends or relatives. They spend less time away, book later and are younger than at other airports. They are also most likely to have found out about the service from a recommendation. More passengers at Belfast International airport travel for other reasons, spend longer away, travel alone and have used the service before. Passengers at Dublin airport are more likely to travel for a holiday only. They travel in larger groups and book earlier than passengers at the other airports.

There are few differences between the passengers surveyed at different times of the year in the air markets. Those differences that do exist between business passengers at the three airports can be attributed to survey bias. Belfast City airport is the only airport where seasonality among non-business passengers exists. There are more passengers travelling for a holiday only in September. They spend longer away, are less likely to have used the service before and booked earliest. The earlier booking may be related to a lower

level of familiarity with the service. There are more passengers travelling for other reasons in December and passengers in December and March spend less time away and booked their tickets later. There are more repeat users in June.

The variables which differ between the parts of the market are summarised in figure 8.7.

As in the ferry market this preliminary analysis has only begun to explore the relationships between passengers using *a priori* bases for segmenting the market. Many more bases and combinations of bases deserve further investigation although this is beyond the scope of the present study.

Figure 8.7: Areas of significant difference in the air passenger market

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Level 2
Differences between business and non-business passengers

Travel behaviour	Buying behaviour	Demographics
Purpose of journey	Find out about service	Age
Time spent away	Where tickets purchased	Sex
Previous use	Use of discounts	Marital status
Arrival at airport	Advance purchase time	Income
Continue journey		
Travel with		

Level 3
Differences between airports

Business passengers

Travel behaviour	Buying behaviour	Demographics
Arrival at airport	Find out about service	Age
Continue journey	Where tickets purchased	

Non-business passengers

Travel behaviour	Buying behaviour	Demographics
Time spent away	Find out about service	Age
Arrival at airport	Advance purchase time	
Travel with		
Number in group		

Level 4
Seasonal Differences or differences between surveys

Belfast City
Travel
Arrival at airport
Continue journey

Belfast International
No differences between surveys

Dublin
Travel
Travel at airport

Belfast City
Travel
Purpose of journey
Time spent away
Travel with
Buying
Find out
Advance purchase

Belfast International
Travel
Time spent away
Continue journey

Dublin
No differences between surveys

Chapter 9

Preliminary analyses of freight survey data.

This chapter provides a preliminary analysis of the data collected in the freight surveys. The volume of data collected from the freight market is much smaller than collected from the passenger market. The sample size in the freight shippers (or principals) market is 132 companies (R=26.4%) and 64 companies (R=32%) in the freight agent (or transport operators) market. These response rates are typical for a postal survey. The relatively small size affords little scope to divide the sample into relevent subsets in order to examine differences between these subsets as in the passenger market in the previous two chapters. The comparisons presented in this chapter are therefore based on observation rather than the existence of a statistically significant relationship.

In maintaining compatability with the previous chapters, analyses of the 'benefit variables' i.e., those variables which assess the relative importance which a company places on any attribute of the service when making the purchase decision, are not presented here but will be discussed fully in chapter 12.

GB to Ireland   Ireland to GB

Participate
65·2%

Participate
92·4%

No response
6·1%

Do not participate
1·5%

No response
12·1%

Do not participate
22·7%
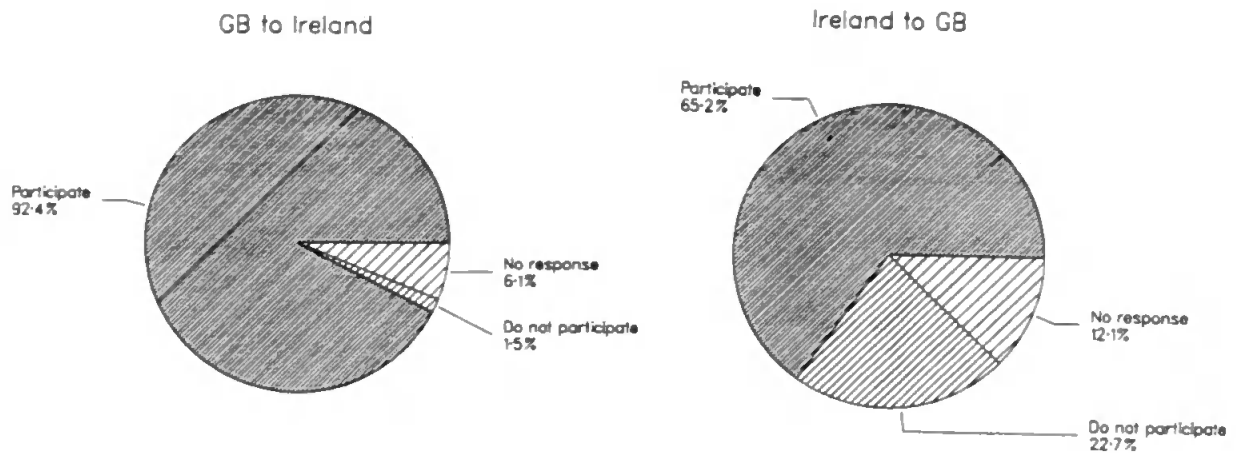
Figure 9.1: Freight shippers: participation in westbound and eastbound trade

9.1 Freight shippers.

9.1.1 Use, selection and payment for freight services.

Overall, there appears to be a greater movement of goods *into* rather than out of Ireland. (figure 9.1). While the majority of companies surveyed participate in both the westbound and eastbound movement of goods, and almost all move goods westbound, a lower proportion (65%) of companies however, either send or recieve eastbound goods (i.e., from Ireland to Great Britain). Control over both the selection of and payment for freight services appears to differ between eastbound and westbound movement of goods (table 9.1). A greater proportion of companies are involved in the selection of and payment for eastbound freight services. This may allow them to exert greater control over the movement of goods out of Ireland.

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Table 9.1: Freight shippers: selection and payment for freight services

Direction and mode of movement	Select %	Pay %
Westbound surface	48.7	39.3
Eastbound surface	80.7	81.6
Westbound air	56.0	44.4
Eastbound air	80.0	70.7

9.1.2 Products

Respondents are asked to apportion their total trade between Great Britain and Ireland into eastbound and westbound freight movements. Almost one third of companies had only westbound goods, in contrast only 10% of companies are involved solely in the eastbound movement of goods. It appears, from figures 9.2 and 9.3, that westbound flows predominate. This is in agreement with overall freight flows between Great Britain and Ireland, in which there is a net movement into Ireland. This imbalance between westbound and eastbound movement of goods is a recognised feature of the Irish sea freight market.

A wide variety of products ranging from bitumen to butter and industrial heat exchangers to geometry sets, are shipped by the companies. These have been grouped into broad categories based on the classification used in the Northern Ireland Trade Directory (1990). About three-quarters of the respondent companies only specified one product and those specifying more than one tended not to transcend product group boundaries. The first product provided by the respondent companies in response to the question, according to category, in eastbound and westbound trade are presented in table 9.2.

The westbound movement of goods includes a large proportion of unfinished goods or raw materials for companies involved in general manufacturing. Engineering goods and textiles also account for significant proportions of
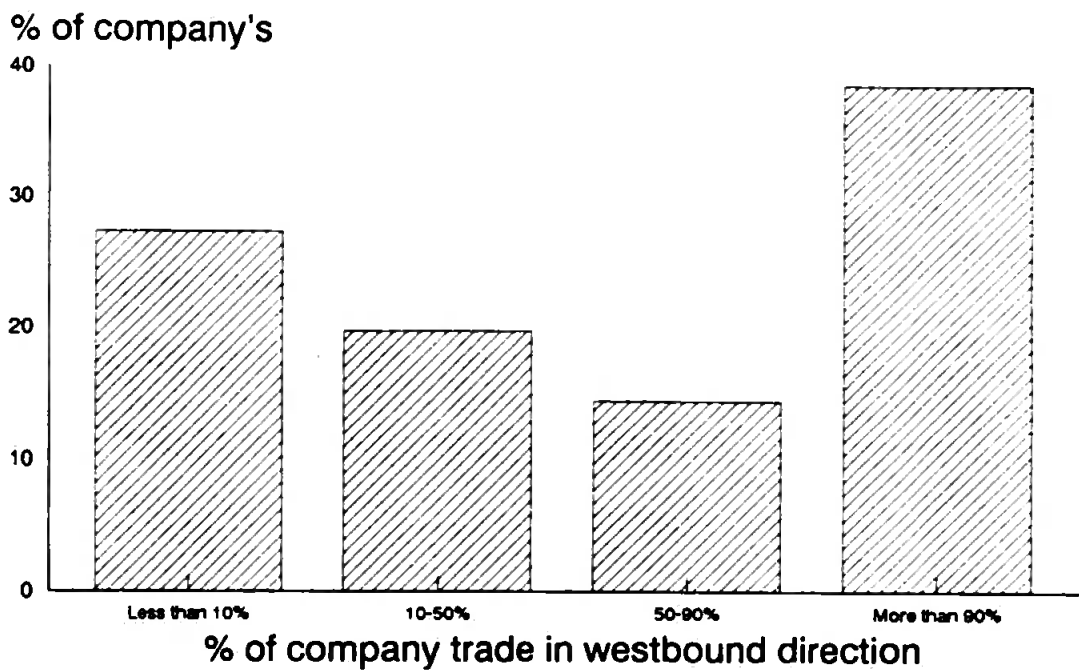
Figure 9.2: Freight shippers: proportion of trade westbound
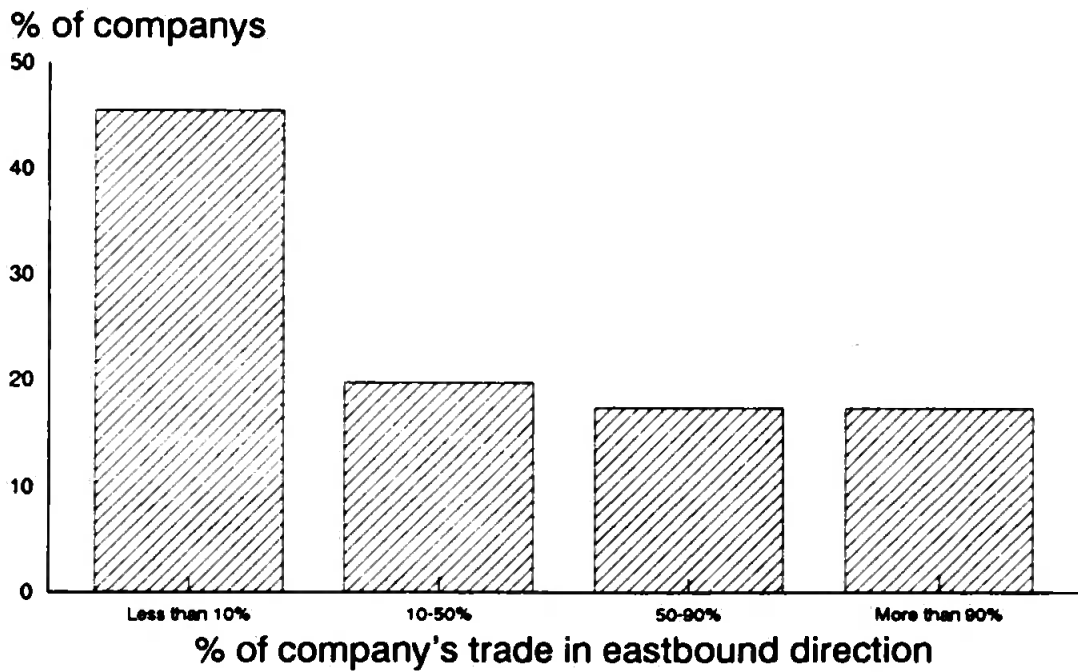
Figure 9.3: Freight shippers: proportion of trade eastbound

Table 9.2: Freight shippers: products in Irish sea trade.

Product Group	% Westbound product	% Eastbound product
Textiles	18.1	16.2
Clothing	1.9	10.0
Food & drink	5.7	16.2
Engineering	21.1	13.7
Gen. Manuf.(unfin.)	41.0	23.8
Gen manuf (finished)	5.7	8.8
Packaging/rejects	6.7	11.2

westbound trade. Unfinished goods for general manufacture are also the single largest product category in the eastbound movement of goods, but they account for a lesser proportion. Textiles are again significant but clothing accounts for 10% of eastbound movements. Products for the food and drink industry also appear to be more important in the eastbound movement of goods, as do finished general manufacturing goods and packaging, rejects or waste goods. This pattern of westbound and eastbound movement of products may suggest that certainly some companies import unfinished goods or component parts *into* Ireland. These goods then undergo a further stage of manufacture and are exported as finished products. This supposition is in line with the aims of both the Northern Ireland Development Board and the Irish Development Agency which attempt to attract companies, preferably more technologically based companies, promoting Ireland as having a skilled labour force and as base from which firms, particularly American firms, can expand into Europe.

About 20% of companies, both eastbound and westbound movements, specify some form of special care required for products in transit. The proportion is slightly higher for eastbound goods, perhaps reflecting the higher proportion of finished goods which move in this direction. The proportion of eastbound goods which require some form of monitoring for on-time delivery

is also higher than for westbound goods.

It appears there is a greater amount of seasonality in the westbound movement of goods. Twenty-eight per cent of respondents involved in westbound movment feel they handle significantly more, or less, of their product during certain months of the year. More westbound goods are handled during the summer and less during winter. More eastbound goods are also handled during summer, and to a lesser extent autumn, while less are handled during winter.

The size of both westbound and eastbound consignments varies considerably in weight and volume. Analysis of this question shows up a design flaw in the questionnaire (question 10). Respondents have given either the weight or volume of a typical, or average, consignment, instead of both weight and volume and indicated whether the weight was in tonnes or kg, which was the intention. Resulting from this flaw, the size and the volume of consigments are difficult to interpret and the volume:weight ratio cannot be calculated.

9.1.3 Movement of goods.

The modes of transport used for the movement of westbound and eastbound goods are presented in table 9.3. The predominant mode of transport for westbound goods is part load by road and sea. This mode is used for at least some of a companies westbound goods movement by over half the companies in the survey and is the sole mode used by 17% of companies. A full road trailer by sea is used for at least some consignments by almost 20% of companies. Less than 5% of companies operate their own road vehicles between Great Britain and Ireland. Rail transport is used by a negligible proportion of companies. This is a little surprising given that rail links exist to most of the major ports for Irish sea traffic and that rail is important in the passenger market for arrival at and departure from ports. However, only Holyhead and Garston have rail freight facilities. Express services are used at some time by 24% of companies for westbound movement of goods

Table 9.3: Freight shippers: transport modes used

Transport option	Westbound %		Eastbound %	
	only option	sometimes use	only option	sometimes use
Full road container and sea	5.3	18.9	7.6	24.2
Full rail container and sea	0.8	1.5	0.8	1.5
Full road trailer and sea	6.8	19.7	5.3	18.2
Part load by rail and sea	–	2.3	0.8	2.3
Part load by road and sea	16.7	55.3	6.8	28.8
Other sea service	–	3.0	–	3.8
Express services	1.5	24.2	1.5	18.9
Full air container	–	1.5	–	–
Consolidated air	0.8	11.4	0.8	12.1
Other air service	1.5	8.3	–	2.3

and by 19% for eastbound movement. A consolidated air service is used by over 10% of companies for both eastbound and westbound goods movement but is the sole mode used by only one company.

Almost half the companies surveyed leave the choice of ports used for shipment to the discretion of the carrier in the westbound movement of goods by surface modes. In contrast, for eastbound movement by surface modes only around a quarter of companies leave the choice of movements to the carrier. This again may suggest greater control by the respondent companies over goods moving out of Ireland. A similar pattern is followed in the choice of airports with one-third and one-fifth of companies leaving the choice up to the carrier for westbound and eastbound movements respectively. The lower proportion of companies leaving the choice of airport to the carrier does of course reflect the lower proportion of companies using air transport. One area for further work is to investigate any differences between those companies which use air services as opposed to those which do not.

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Table 9.4: Freight shippers: frequency of use of sea and air transport services

Frequency of use	Westbound		Eastbound	
	% surface	% surface	% air	% air
Daily	21.9	35.9	7.4	12.3
2-4 per week	16.7	18.5	2.9	7.0
Weekly	20.2	6.5	11.8	7.0
Monthly	27.2	10.9	17.6	14.0
Less than monthly	14.0	19.6	47.1	35.1
Never	–	8.7	13.2	24.6

The frequency with which companies use Irish sea freight transport services is presented in table 9.4. A higher proportion use eastbound transport services on a daily basis. More companies also use a daily eastbound air service. This may be due to the increased importance of food and drink products which move eastbound. The higher proportion of companies which use westbound sea services on a weekly or monthly basis may suggest integration with an inventory or production schedule. The relatively high proportion of companies which use air transport services on a less than monthly basis may suggest that air is used only for urgent or unusual deliveries.

9.1.4 Respondent and company characteristics

In over half of the sample the questionnaire is completed by a person who is stated a major decision maker in the purchase of cross Irish sea freight transport services. A further 33% of questionnaires are answered by someone who is involved in the transport purchase decision (table 9.5).

Thirty per cent of the persons who answered the questionnaire work in either a distribution/despatch department or a sales/commercial department (table 9.6). Just under 7% of respondents are members of a transport department and a similar percentage are members of a shipping, freight or logistics department. The majority of respondents appear to be at a gen-

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Table 9.5: Freight shippers: respondents role in purchase decision

Stated role	%
Major decision maker	55.4
Involved	33.1
Not involved	11.5

Table 9.6: Freight shippers: department of respondent

Department	%
Administration/ accounts	5.1
Sales/commercial	19.2
Distribution/ despatch	20.2
Import/export	11.1
Transport	9.1
Shipping/freight	9.1
Production/operations	9.1
Factory/warehouse	12.1
Other	5.1

eral managerial level and most have held their present position for either between 2 and 5 years or over 10 years (table 9.7).

A range of different sizes of companies, in terms of both number of employees and turnover, are included in the sample (table 9.8). Companies which employ less than 50, 100-200 and 200-500 persons at the premises where the questionnaire is answered each account for about a quarter of the sample. In terms of the total number of employees, the most common size categories are 200-500 and 100-200 employees. Company turnover is also well distributed, despite more than a third of respondents declining to answer this question. Of those companies where turnover is indicated (figure 9.4), almost one-third have a turnover of between £2 million and £5 million. A further 20% have a turnover of over £20 million.

Table 9.7: Freight shippers: time for which respondent has held position

Time (years)	%
1, or less	10.2
2-5	39.1
6-10	19.5
10, or more	31.3

Table 9.8: Freight shippers: number of employees

Number of employees	%	
	This location	Total
50, or less	20.5	11.7
51-100	18.8	18.1
101-200	28.2	20.2
201-500	26.5	25.5
over 500	6.0	24.5
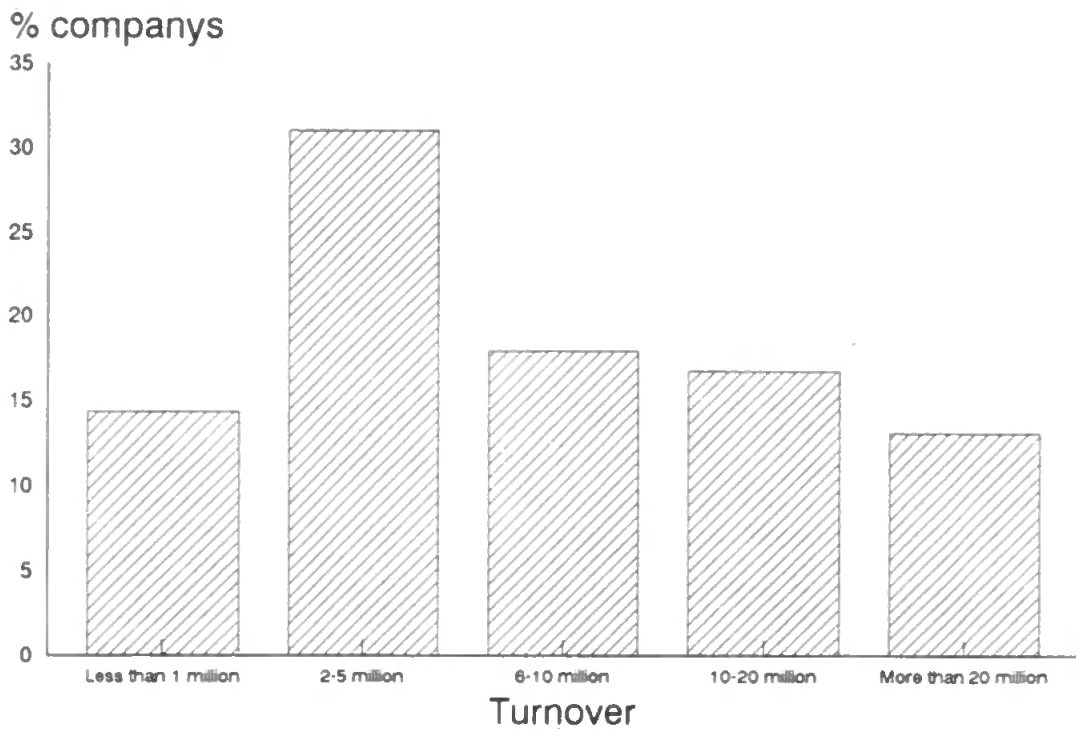
% companys

Figure 9.4: Freight shippers: company turnover
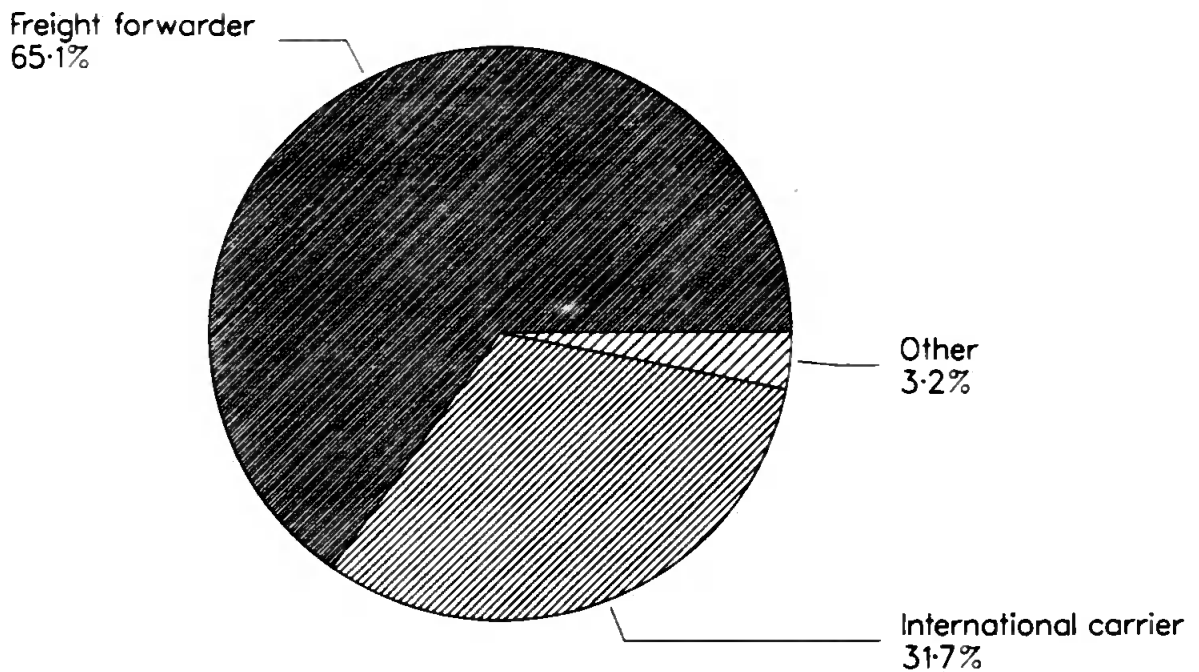
Figure 9.5: Freight agents: type of company

9.2   Freight agents

There were only a few minor differences between the questionnaires which are used in the pilot and full survey. This enables the pilot and full surveys to be combined into a sample of 64 companies with an effective response rate of 32%.

9.2.1   Transport services offered.

Two-thirds of the companies surveyed carry goods between Ireland and Great Britain. However, half of the companies also arrange transport for goods which they do not carry. The majority of freight agents classify themselves (figure 9.5) as a freight forwarding company and the remainder as international carriers.

The most common service offered (table 9.9) by 80% of companies is a door-to-door accompanied service for a full trailer. The predominant mode of transport used by freight principals is a part-load by road and sea and,

Table 9.9: Freight agents: services offered

Service offered	% offering service
Door to door full accomanied trailer	79.7
Door to door full unaccompanied trailer	42.2
(Surface) Express delivery	37.5
Surface groupage	65.6
Air freight/air consolidation	29.7
Documents and customs clearance (surface)	56.3
Documents and customs clearance (air)	31.0
(second survey only)	

Table 9.10: Freight agents: geographical areas served

Area covered	% offering service
Western Europe	76.6
Scandinavia	45.3
Australia	25.0
Eastern Europe	28.1
North America	32.8
Asia	25.0
South America	23.4
Worldwide	29.7

presumably to facilitate this, 65% of operators offer a surface groupage service. Less than one-third offer air or associated services.

Most companies offer a service to Western Europe (table 9.10), which may imply that a quarter of companies operate only between Ireland and Great Britain and not further afield to Europe. The next most commonly served area is Scandinavia. Less than one-third of operators offer either a worldwide service or services to any other part of the world. A slightly higher proportion of companies have a distribution depot in Ireland compared to those which have a distribution depot in Great Britain.

Table 9.11: Freight agents: frequency of use of sea and air services

Frequency of use	% using			
	Westbound sea service	Eastbound sea service	Westbound air service	Eastbound air service
Daily	60.9	53.1	21.9	21.9
2-4 per week	25.0	20.3	3.1	4.7
Weekly	7.8	3.1	6.3	4.7
Monthly	3.1	1.6	3.1	–
Less than monthly	3.1	6.3	–	4.7
Never	–	–	6.3	6.3

9.2.2 Use of sea and air services.

The frequency with which operators use air and sea services is presented in table 9.11. Sea services are more frequently used than air services and daily services are most commonly used.

The most commonly used sea route is Larne to Stranraer which is the 'usual' route for over half of operators and is used sometimes by a further quarter. Other routes which are normally used by a higher proportion of operators (i.e. > 20%) are:

- Larne-Cairnryan

- Belfast-Heysham

- Holyhead-DunLaoghaire.

Apart from the routes mentionned above, a higher proportion of operators use routes 'sometimes' than the proportion which used the route 'usually'. It is possible that a route which it is indicated that an operator used 'sometimes' forms a back-up to the normal route. The two shortest routes, Larne-Stranraer and Larne-Cairnryan are used by proportionally more operators. The attractiveness of the shortest routes, operated by multi-purpose vessels,

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is discussed in chapter 4. Of the routes which serve freight traffic exclusively, only the Belfast-Heysham route appears to have a higher proportion of normal use. Routes operated by container vessels, e.g., Belfast-Garston appear to be used by fewer operators, as do the longer routes in particular, the Belfast-Ardrossan route. The relatively low level of usage on the Belfast-Ardrossan route should be considered in the context of the low proportion of freight capacity which it provides (Matear, 1987). The more commonly used air routes are Belfast-London (a usual route for 17% of operators), Belfast-Manchester (11%), Belfast-Birmingham (11%), Dublin-Manchester (14%) and Dublin-Birmingham (9%).

Over half the companies operate their own road vehicles between Ireland and Great Britain. Of these companies, just over 90% claim they do not operate *any* westbound vehicles empty and 80% do not operate any east bound vehicles empty. Given the imbalance in the Irish sea freight market (see section 9.1.2), it may have been more pertinent to ask what proportion of vehicles are not operated at full capacity, in either direction. Around 5% of operators however, do operate over half their vehicles empty *into* Ireland. The products carried vary widely, over 70% of operators could not name a major product.

9.2.3   Respondent and company characteristics.

The person who answered the questionnaire in the company is more likely to be a member of a transport department (table 9.12) or a shipping/freight department. It is expected that these respondents will play an active role in the purchase of Irish sea freight transport services. Almost one-third of respondents however, have job titles not specifically associated with a transport or shipping department. Respondents are either at a directorial/executive level or managerial level within the company. In common with the freight shippers, the highest proportions of respondents in the freight agent market have spent between 2-5 years in their present position or over 10 years.

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Table 9.12: Freight agents: department of respondent

Department	%
Administration/accounts	11.4
Sales/commercial contracts	5.7
Import/export	14.3
Transport	31.4
Shipping/freight	22.9
Production/operations	11.4
Other	2.9

Table 9.13: Freight agents: number of employees

Number of employees	%	
	This location	Total
10, or less	34.4	23.4
11-20	32.88	29.7
21-50	20.3	21.9
51-100	6.3	9.4
over 100	6.3	15.6

Companies are smaller than encountered among the freight shippers. Over one-third employ 10, or fewer, persons at that location (table 9.13) and a further third employ between 11 and 20 persons. Consideration of the total number of employees of the companies in the survey brings the proportion employing 10 or fewer persons down to 24% and the proportion employing 11-20 persons down to 30%. There are however a significant group of larger companies with over 100 employees.

The impression of a predominance of smaller companies is also gained from the distribution of turnover in the sample (figure 9.6) with almost 40% of company's which answered this question having a turnover of less than £1 million. In contrast again, there is a group (19%) of companies with a turnover in excess of £10 million.
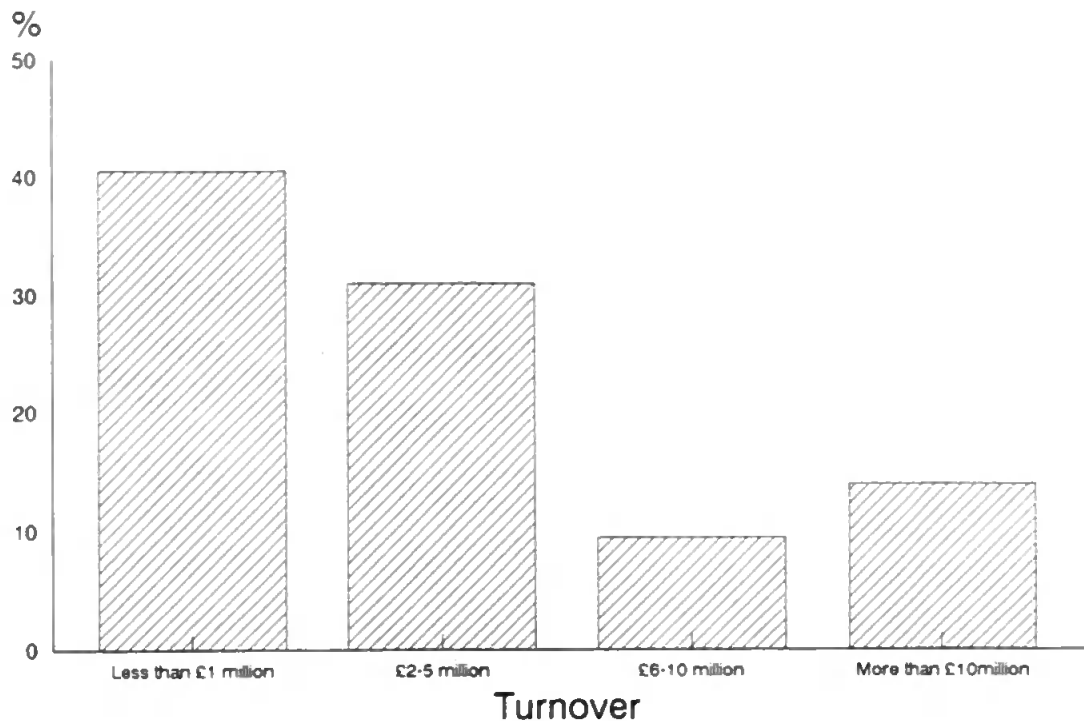
Figure 9.6: Freight agents: company turnover

9.3 Summary

The freight shippers appear to move more goods into rather than out of Ireland but more control is exerted over the eastbound movement of goods. The main product category for westbound goods is general manufacturing unfinished goods but textiles and products for the food and drink and engineering industries are more significant among eastbound products.

The predominant transport mode used is a part-load by road and sea. A minority of companies are involved in the choice of shipment port for westbound goods but more participate in the decision for eastbound goods. A greater proportion of eastbound movement of goods is on a daily basis.

Respondents in the freight shipper market tend to be major decision makers for transport purchases who have held their present position within the company for 2-5 years or over 10 years. The companies vary in size.

The majority of the freight agents are freight forwarding companies which offer road transport for full or part-loads and largely confine their area of

operation to Western Europe. The predominant route used by freight agents is Larne to Stranraer.

The questionnaire is generally answered by a member of a transport or a shipping/freight department. Companies tend to be smaller than encountered among the shippers, in terms of both turnover and number of employees.

Chapter 10

Benefit segment construction and profiling in the sea passenger market

This chapter is concerned with the development and profiling of benefit segments in the sea passenger market. The methodology used to develop the segments is discussed in chapter 6. To facilitate easier handling of the data and also to improve interpretation and usefulness for management, the analyses have been performed on six subsets of the data. Car and foot passengers are analysed independently for each of the three routes. This level of analysis corresponds to level three in the preliminary analysis.

10.1   Car passengers on the Larne-Stranraer route

The mean scores for the service attributes by car passengers on the Larne-Stranraer route are presented in figure 10.1 This figure serves only to give a general view of which service attributes appear to have been rated more, or less, highly than others. It does not help in the understanding of which

attributes particularly determine choice of service, where the variance in the data lies, or whether different groups of passengers may have a different pattern of mean scores. Therefore, principal components and cluster analysis are employed to explore these elements.

10.1.1   Principal components analysis

Principal components analysis of car passengers on the Larne-Stranraer route results in eight components. Together these account for 63.1% of the total variance in the data set. The components, following varimax rotation are presented in table 10.1. The two main themes emerging from principal components analysis are the dominance of time based and facilities based components. The remaining components are concerned with price and on board service.

10.1.2   Benefit segment construction

Clustering on factor scores produces 5 useable benefit segments, presented in figure 10.2. It is encouraging that this stage of the analysis identifies respondents who give a constant score of either 5 or 1 and that this profile is not clustered with other profiles which use the full range of rating options. The mean factor scores for the segments are presented in table 10.2. To improve ease of interpretation the mean factor scores are plotted on an umbrella diagram (see figure 10.3) which allows the 'shape' of the segments to be compared. The pattern of mean factor scores is used as the basis for labelling segments. This is shown in table 10.3.

10.1.3   Profiling benefit segments

The independent or descriptor variables which chi-squared analysis suggests differ significantly (at the 0.05 significance level) between all segments are
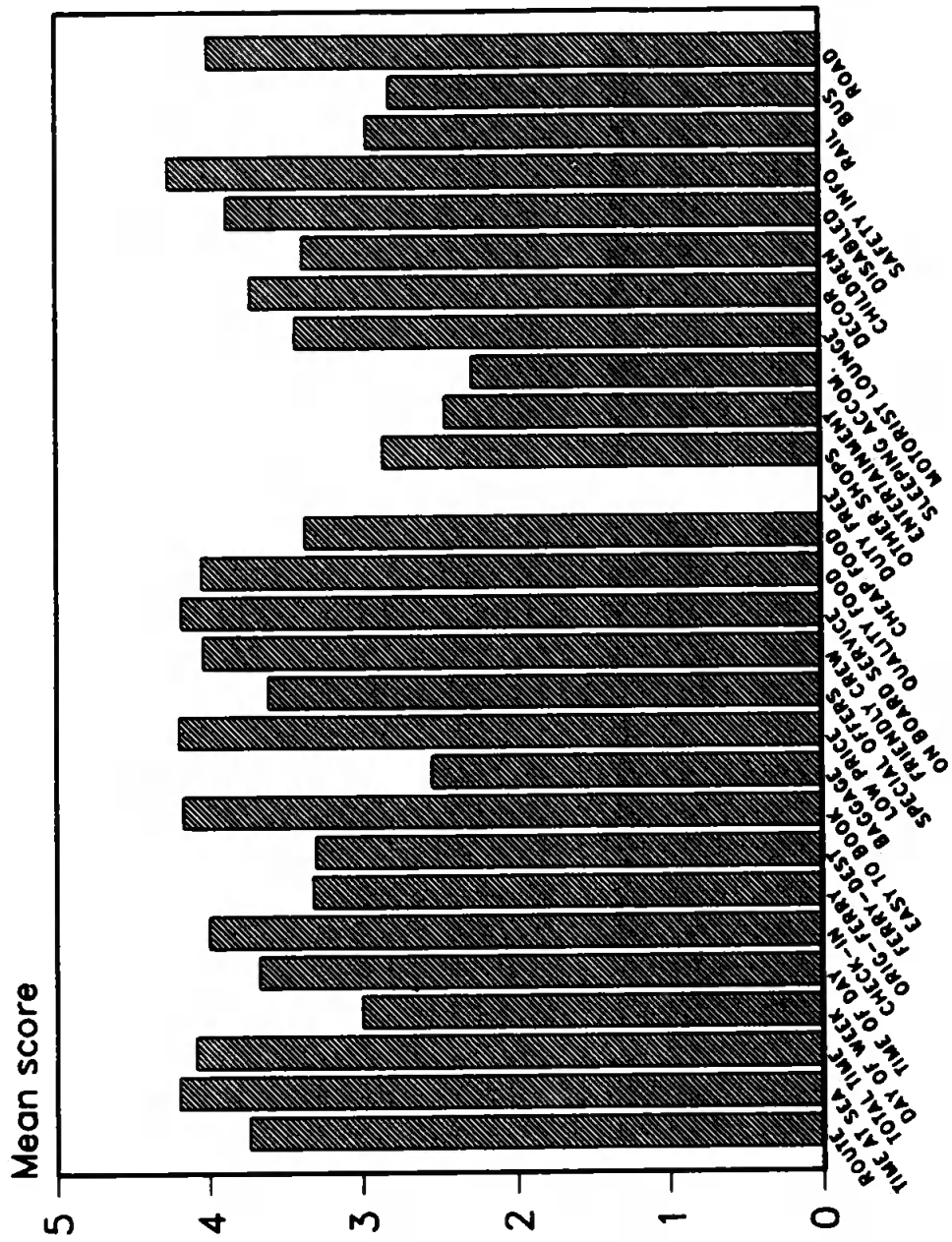
Figure 10.1: Mean scores for service attributes, Larne-Stranraer car passengers

Table 10.1: Principal components for Larne-Stranraer car passengers

Principal component	service attributes loading >0.5	Components named
PC$_1$	Facilities for children and disabled persons, public transport connections	Minority group facilities
PC$_2$	Friendly attitude, good service and good food	On board service
PC$_3$	On board shops, entertainment	On board facilities
PC$_4$	Check-in time required, distance to and from origin and destination	Access time
PC$_5$	Price and discount fares	Price
PC$_6$	Crossing and total travel time	Travel time
PC$_7$	Time and day of departure	Schedule
PC$_8$	Motorist's lounge and decor	Majority group facilities
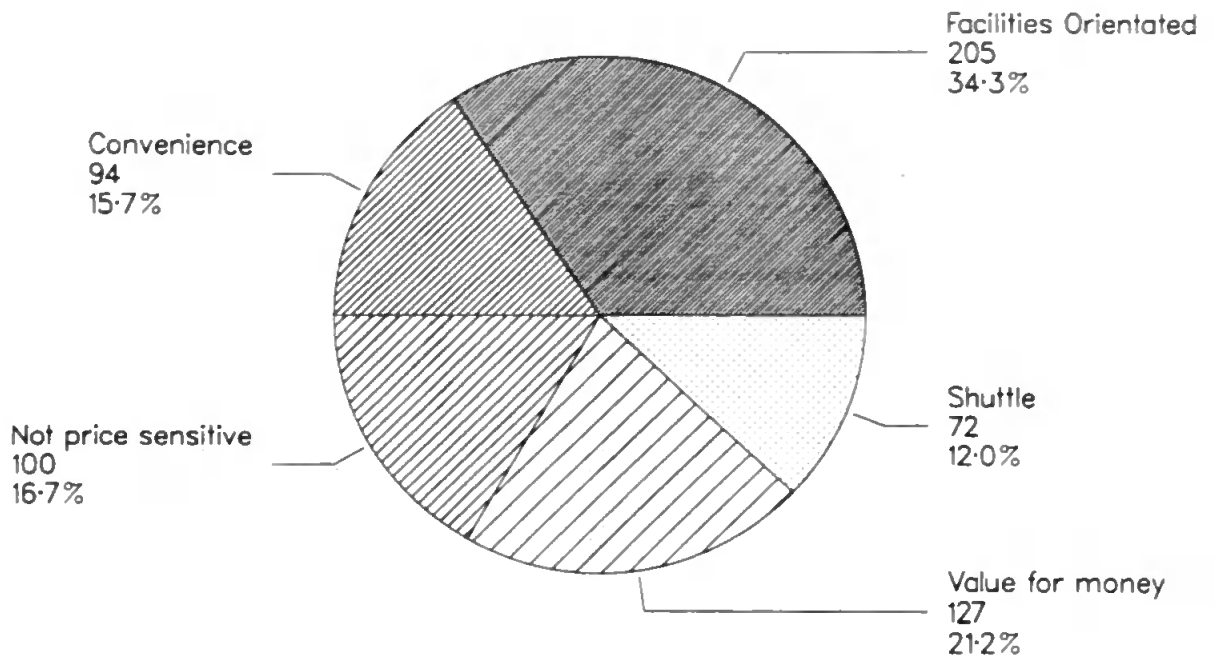
Figure 10.2: Size of benefit segments, Larne-Stranraer car passengers

Table 10.2: Mean factor scores for segments: Larne-Stranraer car passengers. Figures in brackets give the number of cases in each segment.

Component	Mean factor score				
	Segment 1 (205)	Segment 2 (94)	Segment 4 (100)	Segment 5 (127)	Segment 6 (72)
Minority groups	0.639	-0.943	0.081	-0.113	-0.651
On board service	0.09	-0.115	0.299	0.61	-1.296
On board facilities	0.409	0.098	-0.372	-0.22	-0.602
Access time	0.192	0.848	-0.779	-0.214	-0.299
Price	0.328	-0.574	-1.335	0.556	0.564
Travel time	0.334	-0.395	0.258	-0.749	0.67
Schedule	0.281	0.503	-0.169	-0.626	-0.428
Majority facilities	0.139	-0.258	0.194	-0.321	0.27

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Figure 10.3: Larne-Stranraer car passengers, umbrella diagrams

Facilities orientated

Convenience

Not price sensitive

Value for money

Shuttle

1: Minority facilities

2: On board service

3: On board facilities

4: Access time

5: Price

6: Travel time

7: Schedule

8: Majority facilities
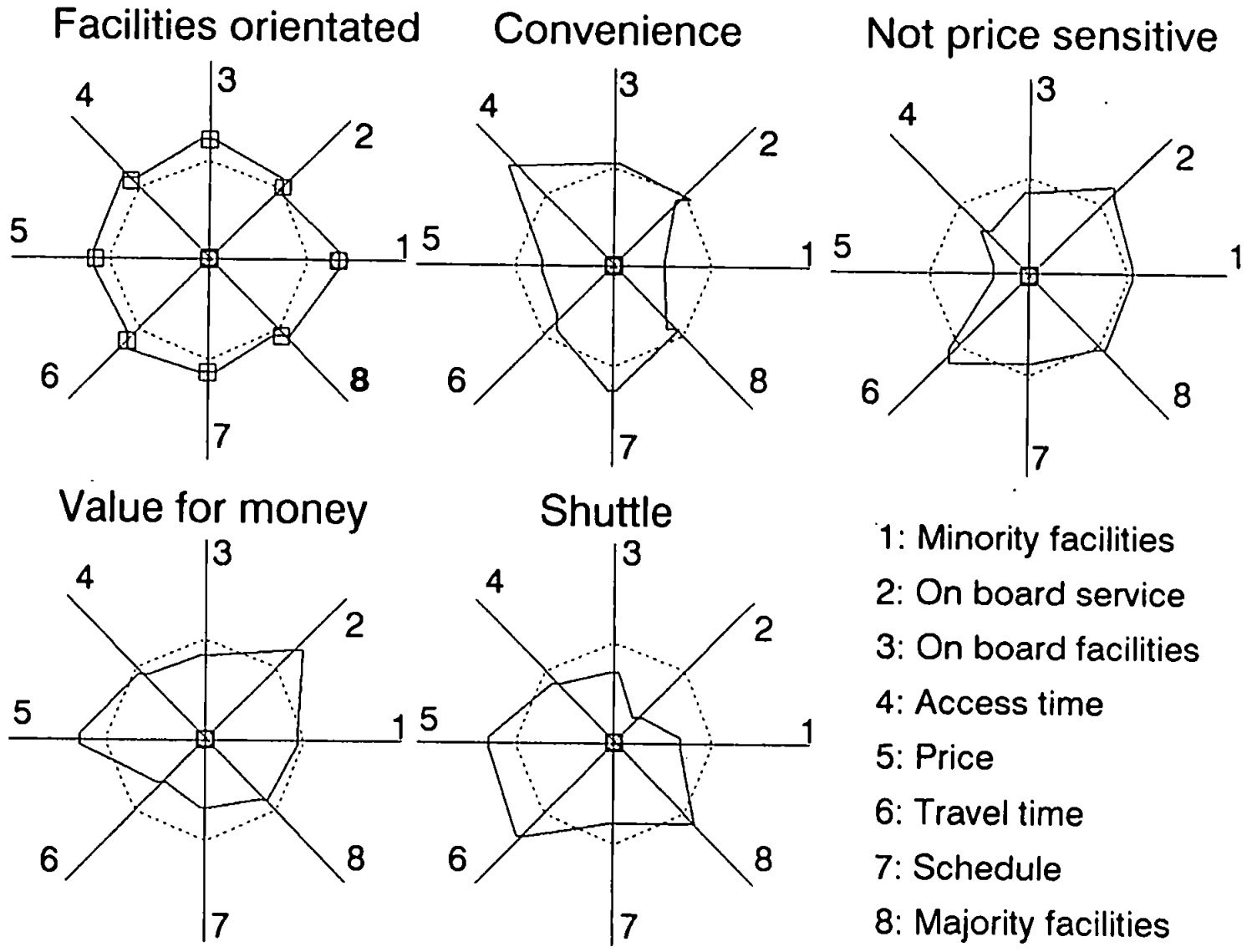
Table 10.3: Benefit segment labels, Larne-Stranraer car passengers

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (205)	Minority group facilities On board facilities		Facilities orientated
2 (94)	Access time Schedule	Minority group facilities, Price	Convenience (Classic car)
4 (100)	On board service Travel time	Price Access time	Not price sensitive
5 (127)	On board service Price	Travel time Schedule	Value for money
6 (72)	Travel time Price	On board facilities Minority group facilities	Shuttle

as follows:

- Departure time

- Purpose of journey

- Time spent away

- Distance travelled to the port

- Type of place from where journey starts

- Type of group the passenger is travelling with

- Type of ticket purchased

- Age of passenger

- Sex of passenger

Table 10.4: Profile of the 'facilities orientated' segment, Larne-Stranraer car passengers

28% travel on afternoon sailings
17% travel for 'other' reasons
72% spend less than one week away
51% purchase 60/120 hour return tickets
14% begin the journey from a place of holiday
58% travel with their family
42% are female

The Facilities orientated Segment

The profile for the 'facilities orientated' segment, in terms of the above variables, is presented in table 10.4. This is the largest segment among car passengers on the Larne-Stranraer route. Positive mean factor scores exist for all factors, indicating everything is important, to a greater or lesser extent. The importance attached to all factors may indicate a lack of critical discriminatory ability by passengers. Alternatively, the service may be perceived to be of such a basic standard that it is not possible for this segment to discriminate further. The 'facilities orientated' segment contains the highest proportion of passengers who are travelling for reasons other than a holiday, holiday/visit to friends or relatives or business. This segment spends the least time away and, in conjunction with this, they also purchase a higher proportion of 60 or 120 hour return tickets. Passengers in this segment are more likely begin the current journey from a place of holiday, than other segments. The majority of this segment travel with their family. Although the number of persons in the travel group does not differ significantly between segments, if this includes children it may explain the high mean factor score attached to minority group facilities. The 'facilities orientated' segment has the highest proportion of female passengers.

The Convenience Segment

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Table 10.5: Profile of the 'convenience segment, Larne-Stranraer car passengers

36% travel for business, 35% for holiday/vfr
92% spend less than 3 weeks away
16% begin the journey from a work place
25% travel with friends, 25% with family
70% travel less than 100 miles to the port
17% purchase single tickets
36% travel on mid-morning sailings, 29% on afternoon
70% are male

Access time and schedule are the most important factors for the 'convenience' segment (see table 10.5) with price and facilities for minority groups relatively unimportant. The 'convenience' segment (or 'classic car passengers') has the highest proportion of passengers who travel for business and the lowest proportion of passengers who are on holiday/visiting friends and relatives. In contrast to what might be expected from a segment with a higher proportion of business travellers, there is a higher proportion, than in other segments, spending more than three weeks away. However, as might be expected, a higher proportion of this segment start the current journey from their place of work. Also in possible conjunction with there being a higher proportion of business travel in this segment, there are higher proportions of passengers who are either travelling alone or with friends and a lower proportion who travel with their family. The fact that almost 70% of this segment travel less than 100 miles to the port supports the 'convenience' label.

The Not price sensitive segment

The 'not price sensitive' segment (see table 10.6) contains the highest proportion of passengers who give holiday, combined with a visit to friends or relatives, as their reason for travel. This segment has the highest proportions of passengers who travel on the late evening or overnight sailings. A

Table 10.6: Profile of the 'not price sensitive' segment, Larne-Stranraer car passengers

```
50% on holiday/visit to friends and relatives
26% travel on evening sailings, 7% overnight
24% begin the journey from a relatives home
61% travel with their family
50% spend 1-3 weeks away
62% purchase an ordinary return for car and passengers
52% travel over 100 miles to the port,
21% travel more than 300 miles
39% are aged between 25 and 34
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Table 10.7: Profile of the 'value for money' segment, Larne-Stranraer car passengers

```
61% travel less than 100 miles to the port
24% on holiday only
68% begin the journey from their normal residence
10% travel with familiy and friends
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higher proportion of passengers travel with at least one other member of the family and are more likely to start the current journey from a relatives home. They are more likely than other groups to spend between 1 and 3 weeks away and consequently purchase a higher proportion of ordinary return tickets for a car and passengers. This ticket is more expensive than the 60/120 hour return ticket. Fewer than expected passengers in this segment travel less than 100 miles to the port and this segment has the highest proportion of passengers who travel more than 300 miles to the port. This feature may help explain the predominance of this segment travelling on the late evening or overnight sailings, presumably passengers have driven to the ferry during the day and may also contribute to the importance attached to on board service by this segment.

The Value for money segment

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Table 10.8: Profile of the 'shuttle' segment, Larne-Stranraer car passengers

45% on holiday/visit to friends and relatives
10% spend less than 24 hours away
60% purchase 60/120 hour return tickets
43% travel over 200 miles to the port
25% travel alone
37% are aged between 45 and 64

More passengers in the 'value for money' segment (see table 10.7) travel on the mid-morning sailings. Using the same argument as previously, it is not suprising to find that a higher proportion of this segment travel less than 100 miles to the port and are therefore able to arrive in time for the morning sailings. However, more passengers than expected travel more than 200 miles. This segment has the highest proportion of passengers who are on holiday and who start the journey from their normal residence. A higher proportion of this segment, in common with the 'convenience' segment, travel with friends but there is also a higher proportion who travel with a mixed group of family and friends. Perhaps the larger group size influences the need to obtain value for money. This segment is particularly composed of passengers in the age ranges 15-24, 35-44 and over 64.

The Shuttle segment

The other segment which appears to be more sensitive to price is the 'shuttle' segment (see table 10.8). Alternatively this segment could also be termed 'deal prone' as it appears to be concerned with the trade off between price and travel time. This trade-off may prompt the members of this segment to switch to a faster mode of transport (*eg.* air) if the price of the faster mode was to fall or the income of the segment to rise. The 'shuttle' segment has the second highest proportion of passengers who combine a holiday with a visit to friends and relatives. In contrast to the 'least price sensitive' segment which has the highest proportion of passengers giving this reason

for travel, the 'shuttle' segment has the highest proportion of passengers who spend less than 24 hours away. In conjunction with this it also has the highest proportion purchasing 60 or 120 hour return tickets. This relatively short time spent away is consistent with the need for a short travel time and also possibly price. However, the 'shuttle' segment contains the lowest proportion of passengers who travel less than 100 miles to the port. Fewer passengers than expected travel between 100 and 200 miles, but more than expected travel over 200 miles to the port, which may not be consistent with the need for a short travel time. More passengers in this segments travel alone.

10.2 Car passengers on the Holyhead-DunLaoghaire route

The profile of mean scores for service attributes is shown in figure 10.4. Visual comparison of the profiles for car passengers on the Larne-Stranraer and Holyhead-DunLaoghaire routes shows the patterns to be very similar. The main difference appears to be that special offers and other shops are given a lower mean score on the Holyhead-DunLaoghaire route.

10.2.1 Principal components analysis

Only seven components emerge from principal components analysis of car passengers on the Holyhead-DunLaoghaire route. The 7 components account for 58.4% of total variance, a lower percentage than explained by principal components analysis of car passengers on either of the other routes. The factors are presented in table 10.9. They differ slightly from the components developed for car pasengers on the Larne-Stranraer route in that two components, on board service/environment and on board facilities, have a more complex composition, involving more aspects of the service.

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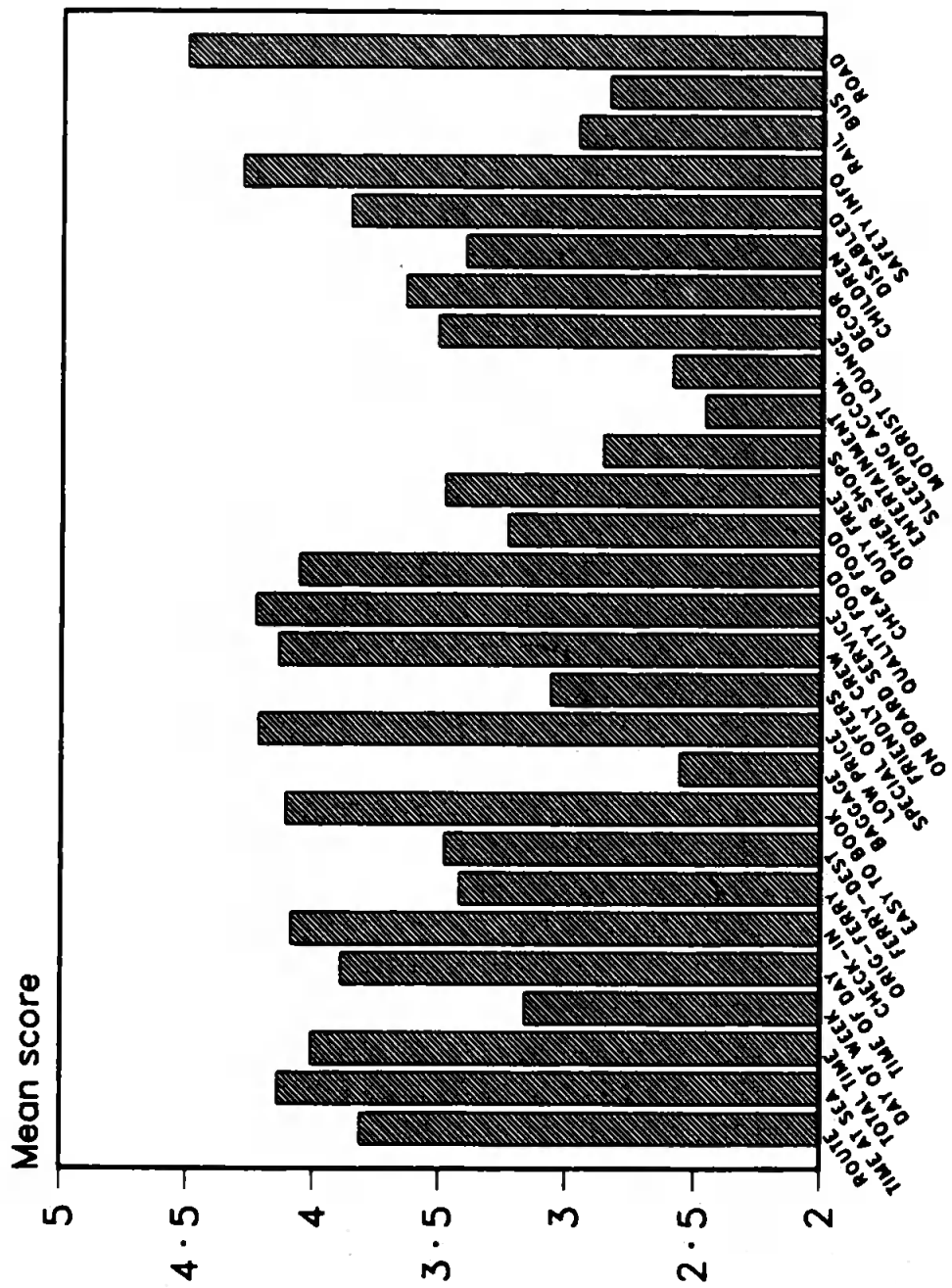
Figure 10.4: Mean scores for service attributes, Holyhead-DunLaoghaire car passengers

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Table 10.9: Principal components for Holyhead-DunLaoghaire car passengers

Principal Components	Service attributes loading >0.5	Component named
PC$_1$	Friendly attitude, good service, good food, pleasant decor, safety information and road connections	Service/ environment
PC$_2$	Facilities for children and disabled persons, public transport connection	Minority groups facilities
PC$_3$	Duty-free shops, other shops, entertainment and sleeping accommodation	On board facilities
PC$_4$	Distance to and from origin and destination	Access
PC$_5$	Crossing and travel time	Travel time
PC$_6$	Price and cheap food	Cost
PC$_7$	Time and day of departure	Schedule
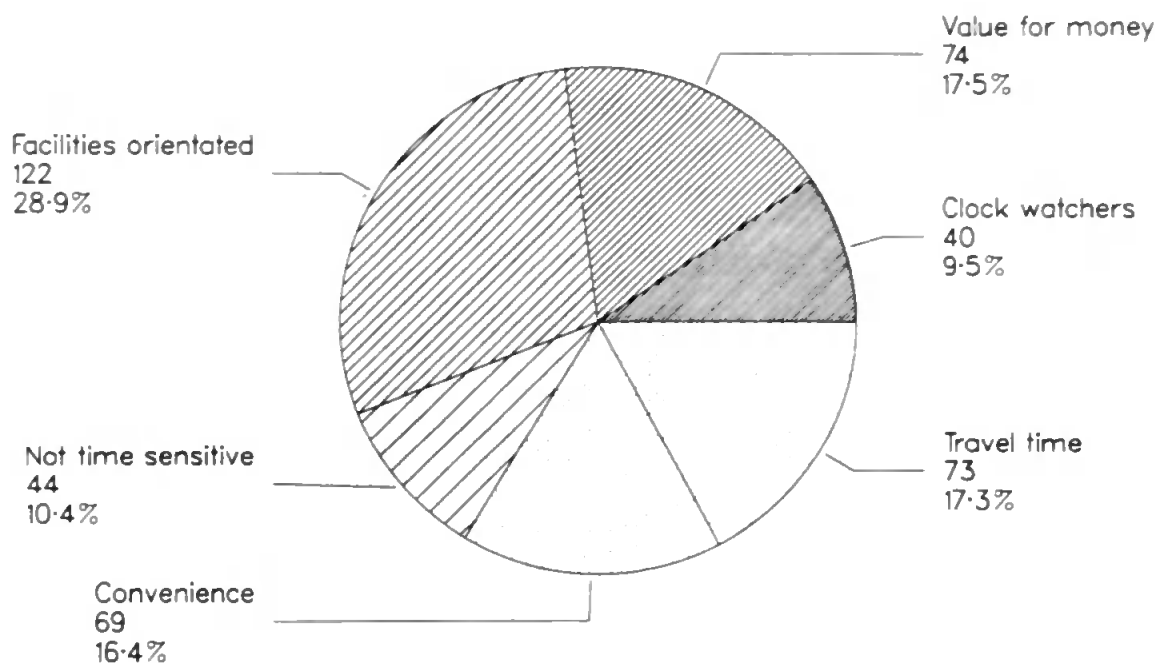
Figure 10.5: Size of benefit segments, Holyhead-DunLaoghaire car passengers

10.2.2 Benefit segment construction

Clustering on factor scores produces 6 segments with 10 or more members (see figure 10.5). The mean factor scores for the segments are presented in table 10.10 and represented graphically using umbrella diagrams in figure 10.6. Again the mean factor scores are used as the basis for labelling segments (table 10.11).

10.2.3 Profiling benefit segments

The independent or descriptor variables which chi-squared analysis suggests differ significantly at the 0.05 significance level between all segments are as follows:

- Purpose of journey

- Distance which passengers live away from (either) port

Table 10.10: Mean factor scores for segments: Holyhead-DunLaoghaire car passengers. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (40)	Segment 2 (74)	Segment 3 (122)	Segment 4 (44)	Segment 5 (69)	Segment 6 (73)
Service	-1.463	0.571	0.075	0.375	-0.396	0.186
Minority groups	-0.981	-1.21	0.704	0.381	-0.475	0.518
On board facilities	0.327	-0.131	0.536	-0.537	0.236	-0.83
Access	-0.629	-0.202	0.4	0.109	0.283	-0.585
Travel time	0.367	0.124	0.124	-1.202	-0.674	0.746
Cost	-0.103	0.711	0.508	-0.425	-0.918	-0.461
Schedule	-0.037	-0.117	-0.083	-1.280	0.390	0.393

Table 10.11: Benefit segment labels: Holyhead-DunLaoghaire car passengers

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (40)	Travel time On board facilities	Service/ environment	Clock watchers
2 (74)	Cost Service/environment	Minority group facilities	Value for money
3 (122)	Minority group facilities On board facilities		Facilities orientated
4 (44)	Minority group facilities Service/environment	Schedule Travel time	Not time sensitive
5 (69)	Schedule Access	Cost Travel time	Convenience (classic car)
6 (73)	Travel time Minority group facilities	On board facilities Access time	Travel time

Figure 10.6: Holyhead-DunLaoghaire car passengers, umbrella diagrams

Clock watchers

Value for money

Facilities orientated

Not time sensitive

Convenience

Travel time

1. Service/environment   3. Onboard facilities 5. Travel time 7. Schedule
2. Minority groups   4. Access   6. Cost

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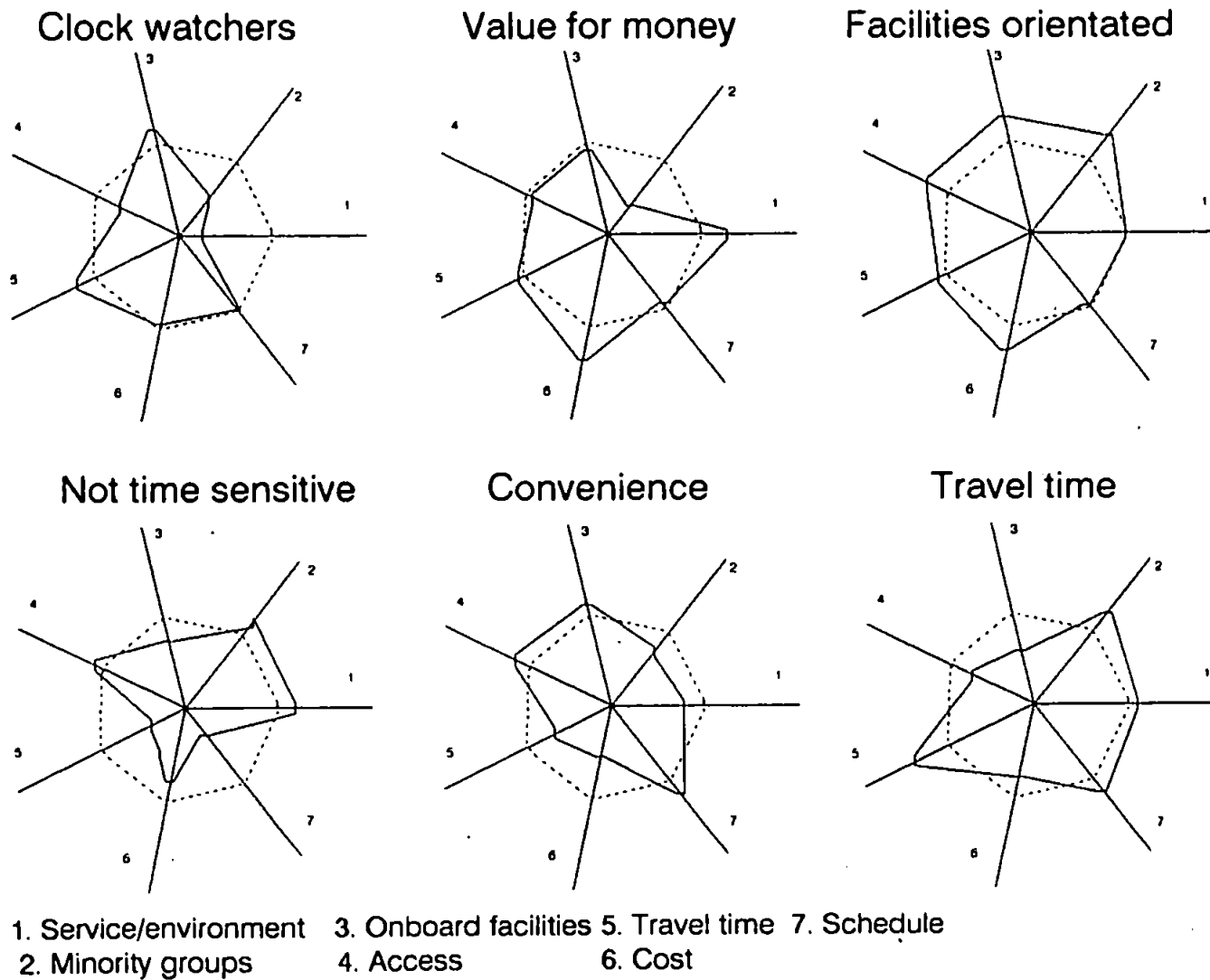
Table 10.12: Profile of the 'clock watcher' segment, Holyhead-DunLaoghaire car passengers

69% on holiday/visit to friends and relatives
37% live less than 50 miles away, 37% 250-300 miles away
28% travel with friends
70% are male
33% are single
20% have an income over £40,000

- Who they are travelling with

- The number in the group

- Sex

- Marital status

- Income.

The clock watcher segment

The smallest segment among Holyhead-DunLaoghaire car passengers is labelled 'clock watchers' because of the greater importance attached to the travel time and on board facilities components. It should be noted that these are the only two components with positive mean factor scores in this segment. The 'clock watcher' segment (see table 10.12) contains the highest proportion of passengers who are combining a holiday with a visit to friends and relatives and also the highest proportion of passengers travelling for 'other' reasons. The 'clock watcher' segment has the highest proportion of passengers who live less than 50 miles away from the port. It also contains a relatively high proportion who live between 250 and 300 miles away from the port. The highest proportion of passengers travelling with friends is found in the segment. This appears to be a relatively high income segment with higher than expected proportions in all income categories over £20,000 and the highest proportion of members in the over £40,000 category.

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Table 10.13: Profile of the 'value for money' segment, Holyhead-
DunLaoghaire Car Passengers

vsppae.25in

22% on holiday only, 21% on business
18% travel alone
58% live between 50 and 250 miles away from the port
64% are male
mid-range incomes

Table 10.14: Profile of the 'facilities orientated' segment, Holyhead-
DunLaoghaire car passengers

68% on holiday/visit to friends and relatives
45% live 1-200 miles away from the port
13% travel with family and friends
55% are female
33% are single
lower incomes

The value for money segment

The 'value for money' segment (see table 10.13) is composed of fewer pas-
sengers on holiday/visiting friends and relatives than expected but contains
higher proportions of passengers who are on holiday only or travelling for
business. More passengers than expected live between 50 and 250 miles away
from either port in the 'value for money' segment and it has the highest pro-
portion who live between 300 and 350 miles away. This segment contains
the second highest proportion of passengers who travel alone and a higher
proportion of male passengers than expected. Overall however, it is difficult
to profile this segment.

The facilities orientated segment

Following the example of car passengers on the Larne-Stranraer route, the
'facilities orientated' segment is also the largest segment to be constructed
for car passengers on the Holyhead-DunLaoghaire route. In common with

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Table 10.15: Profile of the 'not time sensitive' segment, Holyhead-DunLaoghaire car passengers

35% on holiday only
50% live 2-300 miles away from the port
43% are female
43% are not married
lower incomes

the 'clock watchers' segment, the 'facilities orientated' segment (see table 10.14) also has a high proportion of passengers on holiday/visiting friends and relatives and a higher proportion of single passengers. The 'facilities orientated' segment has the highest proportion of passengers who live between 100 and 200 miles away from the port(s). The highest proportion of passengers travelling with family and friends is found in this segment. In contrast however, the 'facilities orientated' segment is the only segment to contain a predominance of female passengers. Again in contrast to the 'clock watcher' segment, who are also concerned about on board facilities although not to the same extent, the 'facilities orientated' segment appears to be a low income segment. The 'facilities orientated' segment has the highest proportion of members in all income categories less than £15,000. Particularly noticeable is the proportion in the less than £5,000 category which is twice the overall proportion of car passengers on the Holyhead-DunLaoghaire route.

The not time sensitive segment

The 'not time sensitive segment' (see table 10.15) has the highest proportion of passengers travelling for a holiday only, twice the overall proportion. Half of this segment live between 200 and 300 miles away from the port(s). In common with the 'facilities orientated' segment this segment has a higher proportion of females than expected and also a higher proportion of passengers who are not married. Still in common with the 'facilities orientated' segment, passengers in the 'not time sensitive' segment belong to lower in-

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Table 10.16: Profile of the 'convenience' segment, Holyhead-DunLaoghaire car passengers

36% travel for business
11% live less than 50 miles away
24% travel alone
70% are male
70% are married
higher incomes

come categories.

The Convenience segment

In common with the 'convenience' segment on the Larne-Stranraer route, the 'convenience' segment (see table 10.16) on the Holyhead-DunLaoghaire route has the largest proportion of business travellers. It also has the highest proportion of passengers who are travelling alone. In contrast to the 'convenience' segment on the Larne-Stranraer route, this 'convenience' segment contains the lowest proportion of passengers who live less than 50 miles away from either port. There is a higher proportion of male passengers than expected and a high percentage who are married. This segment has the highest proportion of members in the £25-40,000 income category and also the highest proportion in the £15-20,000 category.

The travel time segment

The 'travel time' segment is of similar size to the 'value for money' segment. Compared with other segments this segment places more importance on departure time or schedule. Least importance is placed on on board facilities and the cost component also emerges as relatively unimportant. In contrast to the importance placed on travel time, it is suprising that the component concerned with distance to and from the port is relatively unimportant. This may suggest this segment has a more integrated approach to the total

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Table 10.17: Profile of the 'travel time' segment, Holyhead-DunLaoghaire car passengers

61% on holiday/visit to friends and relatives
33% live less than 100 miles away
82% travel with family
44% are female
88% are married
higher incomes

journey with the ferry crossing comprising only one part of the journey. The 'travel time' segment (see table 10.17) is composed of more holiday/visiting friends and relatives traffic than expected and has the largest majority of passengers who are travelling with their family. This segment appears to live fairly near the port(s). In common with the 'clock watcher' segment, a third of passengers live less than 100 miles away. In contrast however, there is also a small proportion, larger than expected, who live more than 300 miles away. There is a slightly higher proportion of female passengers than expected and the highest proportion of married passengers. Again this segment appears to have a fairly high income profile with more members than expected in the over £40,000 and £20-25,000 income categories and lower than expected proportions in all other categories.

10.3 Car passengers on the Fishguard-Rosslare route

The profile of mean scores for the service attributes is presented in figure 10.7. It follows the same pattern as found on the Holyhead-DunLaoghaire route.
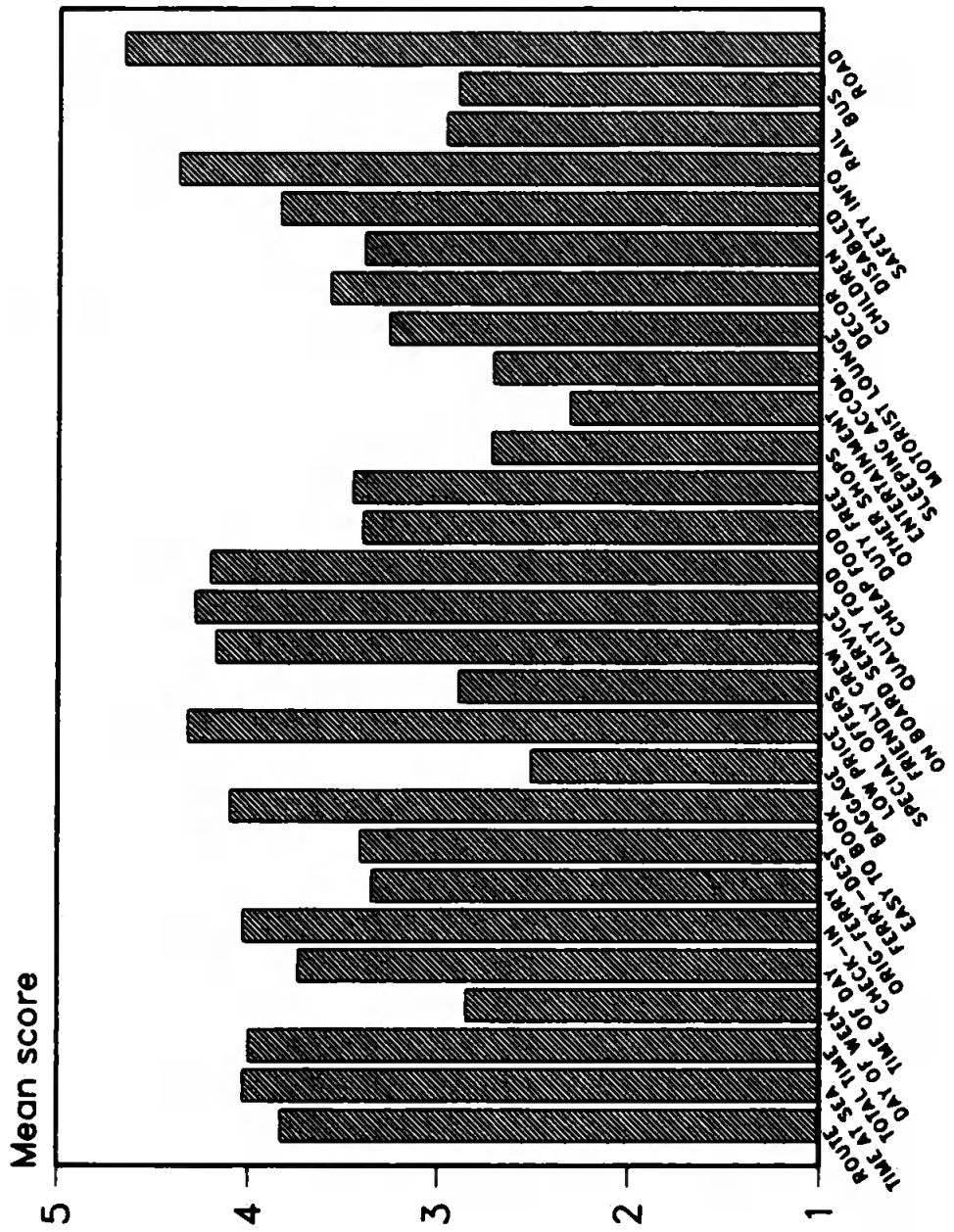
Figure 10.7: Mean scores for service attributes: Fishguard-Rosslare car passengers

Table 10.18: Principal components for Fishguard-Rosslare car passengers

Principal Components	Service attributes loading >0.5	Component named
PC$_1$	Facilities for children and disabled persons, public transport connections	Minority group facilities
PC$_2$	Friendly attitude, good service and good food	On board service
PC$_3$	Duty-free shops, other shops, entertainment	On board facilities
PC$_4$	Distance to and from origin and destination	Access
PC$_5$	Crossing and travel time	Travel time
PC$_6$	Time and day of departure	Schedule
PC$_7$	Motorist lounge and decor	Majority group facilities
(PC$_8$) *	Route	(Route)
PC$_9$	Price	Price

* Negative factor

10.3.1 Data reduction

Principal components analysis of car passengers on the Fishguard-Rosslare route yields 9 components with eigenvalues>1. Together these components explain 64% of total variance, the highest of the car passenger data sets. The components are presented in table 10.18. It should be noted that a negative component, comprising only 1 service attribute, route, emerges. The implications for interpretation of this component are that a negative mean factor score indicates the component to be important and *vice versa*.

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Table 10.19: Mean factor scores for segments: Fishguard-Rosslare car passengers

Component	Mean factor score				
	Segment 1	Segment 2	Segment 3	Segment 5	Segment 6
Minority groups	-1.070	-0.290	-0.343	0.625	0.355
On board service	0.399	-0.277	-1.199	0.153	0.434
On board facilities	0.063	-1.435	-0.148	0.569	-0.167
Access time	-0.578	-0.210	-0.08	0.08	0.552
Travel time	0.038	0.687	-0.585	0.284	-0.526
Schedule	0.4013	-0.377	0.143	-0.405	0.297
Majority facilities	-0.138	0.684	-0.452	0.081	-0.157
(Route)	-0.278	0.196	-0.477	-0.277	0.741
Price	0.549	-0.241	-0.96	-0.044	0.451

10.3.2 Benefit segment construction

Clustering on principal component scores produces 5 useable segments (see figure 10.9). The mean factor scores for segments are presented in table 10.19 and the umbrella diagrams are presented in figure 10.8. The more important and unimportant components according to the mean factor scores are again used as the basis for labelling segments. This is shown in table 10.20.

10.3.3 Profiling benefit segments

The independent or descriptor variables which chi-squared analysis suggests differ significantly at the 0.05 significance level between all segments are as follows:

- Purpose of journey

- Previous use of service

- Where tickets are purchased

- Type of ticket purchased

Price sensitive

Travel time

Product orientated

Facilities orientated

Access time

1: Minority groups
2: On board service
3: On board facilities
4: Access time
5: Travel time
6: Schedule
7: Environment
8: Route
9: Price

Figure 10.8: Fishguard-Rosslare car passengers, umbrella diagrams

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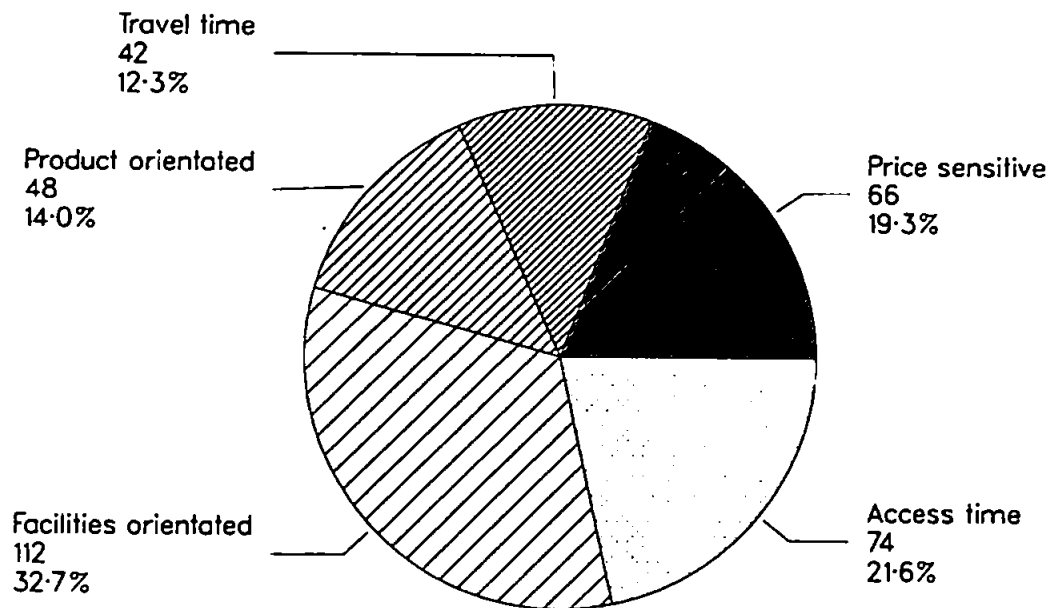
Figure 10.9: Size of benefit segments, Fishguard-Rosslare car passengers

Table 10.20: Benefit segment labels, Fishguard-Rosslare car passengers

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (66)	Price Schedule	Minority facilities	Price sensitive
2 (42)	Travel time Majority facilities	On board facilities Schedule	Travel time
3 (48)	Route Schedule	On board service Price	Product orientated
5 (112)	Minority group facilities On board facilities	Schedule	Facilities orientated
6 (74)	Access time Price	Route Travel time	Access time

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Table 10.21: Profile of the 'price sensitive' segment, Fishguard-Rosslare car passengers

```
34% on holiday only
80% purhase tickets from a travel agent
15% purchase weekend excursion tickets
49% purchase tickets more than 3 weeks in advance
70% are male
61% are aged over 35
lower incomes
```

- Advance purchase time of tickets

- Age

- Sex

- Income

The Price sensitive segment

The 'price sensitive' segment (see table 10.21) contains fewer holiday/visiting friends and relatives traffic than expected but more holiday only and business passengers. It also has the highest proportion of first time users. Probably in conjunction with there being more holiday traffic, there is also a higher proportion of passengers who purchase tickets from a travel agent and also the highest proportion of passengers purchasing excursion fares in this segment. The proportion of passengers purchasing excursion fares will have been influenced by the timing of the survey; three of the Fishguard-Rosslare surveys were conducted on a Monday/Tuesday and the other on a Wednesday. Also in conjunction with a higher proportion of holiday traffic this segment contains the highest proportion of passengers who purchase tickets more than three weeks in advance. There are more males than expected in this segment and the highest proportions of passengers aged over 35. Possibly aligned to the importance placed on price, this segment appears to have

Table 10.22: Profile of the 'travel time' segment, Fishguard-Rosslare car passengers

61% on holiday only
45% purchase tickets more than 3 weeks in advance
41% are female
57% are aged over 45
50% have an income over £25,000

a lower income profile with the highest proportion of passengers in the £5-10,000 income category and lower proportions of passengers than expected in income categories over £25,000.

The Travel time segment

The 'travel time' segment is the smallest among Fishguard-Rosslare car passengers. In common with small segments on the other routes there is again a predominance of negative mean factor scores. The 'travel time' segment appears to share several common features with the 'price sensitive' segment. The 'travel time' segment (see table 10.22) has the highest proportion of passengers who are on holiday only. In common with the 'price sensitive' segment, there are also a higher proportion of first time users and also a higher proportion than expected of passengers purchasing tickets more than three weeks in advance. There is however, a higher proportion of passengers who purchase tickets less than one week in advance. In contrast to the 'price sensitive' segment however, there are more female passengers than expected in the 'travel time' segment. This segment has an older age profile with the highest proportions of passengers in the 45-54 and 55-64 age categories and a higher proportion of passengers over 65 than expected. Also in contrast to the 'price sensitive' segment this segment appears to have a higher income profile.

Table 10.23: Profile of the 'product orientated' segment, Fishguard-Rosslare car passengers

32% travel for business
67% are repeat users
81% purchase ordinary return tickets
21% purchase tickets from Sealink shops or offices
43% purchase tickets less than 1 week in advance
81% are male
40% are aged between 25 and 34
30% have an income between £15-20,000

The Product orientated segment

The 'product orientated' segment is so termed because it attaches more importance to two components which are fundamental to the core product of a transport service (Mason, 1991). Route and schedule are the only 2 factors which appear to be important to this segment. Alternatively, this segment could have been termed 'least price sensitive' as it gives the lowest mean component score to the price factor. With respect to the profiling variables (see table 10.23), the 'product orientated' segment contains the highest proportion of business travellers and a higher proportion of repeat users than expected. A lower level of price sensitivity might be expected from business travellers. This segment purchases the highest proportion of ordinary return tickets for a car and passengers. There is a higher proportion of passengers who purchase their tickets from a Sealink shop or office and more tickets than expected are purchased less than one week in advance and 2-3 weeks in advance. This segment contains the highest proportion of males, the highest proportion of passengers aged 25-34 and the highest proportion in the £15-20,000 income category.

The Facilities orientated segment

The 'facilities orientated' segment is again the largest segment to be found

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Table 10.24: Profile of the 'facilities orientated' segment, Fishguard-Rosslare car passengers

56% on holiday/visit to friends and relatives
19% traveling for other reasons
74% are repeat users
73% purchase tickets from a trave agent
20% purchase single or excursion tickets
21% are aged 15-24
44% are female
22% have an income £10-15,000

Table 10.25: Profile of the 'access time' segment, Fishguard-Rosslare car passengers

27% on holiday only
26% purchase tickets from a Sealink shop or office
34% purchase tickets less than 24 hours in advance
47% are female
16% have an income less than £5,000

on a route. It contains (see table 10.24) the highest proportion of holiday/visiting friends and relatives traffic and also the highest proportion of passengers who are travelling for 'other' reasons. This segment has the highest proportion of repeat users. A slightly higher proportion of passengers than expected purchase their tickets from a travel agent and higher proportions of single and weekend excursion tickets than expected are purchased. The 'facilities orientated' segment contains the highest proportion of passengers aged between 15 and 24 and more female passengers than expected. It also appears to have a lower income profile with the highest proportion of passengers with an income in the £10-15,000 category.

The Access time segment

Access time and price are important to the 'access time' segment while travel time and route are unimportant. There are fewer holiday/visiting friends

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and relatives (see table 10.25) and business passengers but more holiday
only and passengers travelling for other reasons than expected in the 'access
time' segment. There is also a higher proportion of first time users than
expected. This segment contains the highest proportion of passengers who
purchase their tickets from a Sealink outlet. It also has the shortest advance
booking horizon. This segment contains the highest proportion of female
passengers and also the highest proportion of passengers with an income of
less than £5,000.

10.4 Foot passengers on the Larne-Stranraer route

The mean scores on service attributes for foot passengers on the Larne-
Stranraer route are presented in figure 10.10. Perhaps suprisingly, the service
attribute profile follows a similar pattern to that of car passengers on this
route. The most apparent differences are the higher mean scores given to
the rail and bus connections service attributes by foot passengers. Foot
passengers also appear to have given a higher mean score to the ease of
booking and baggage handling attributes of the service.

10.4.1 Principal components analysis

Principal components analysis of this data set produces 7 components which
account for 59.3% of the variance. The components, following rotation are
presented in table 10.26. Although low price appears to be the most impor-
tant service attribute it should be noted that a price component does not
emerge from the principal components analysis. PC_2 'on board service at a
reasonable' price is the only component to contain a cost element.
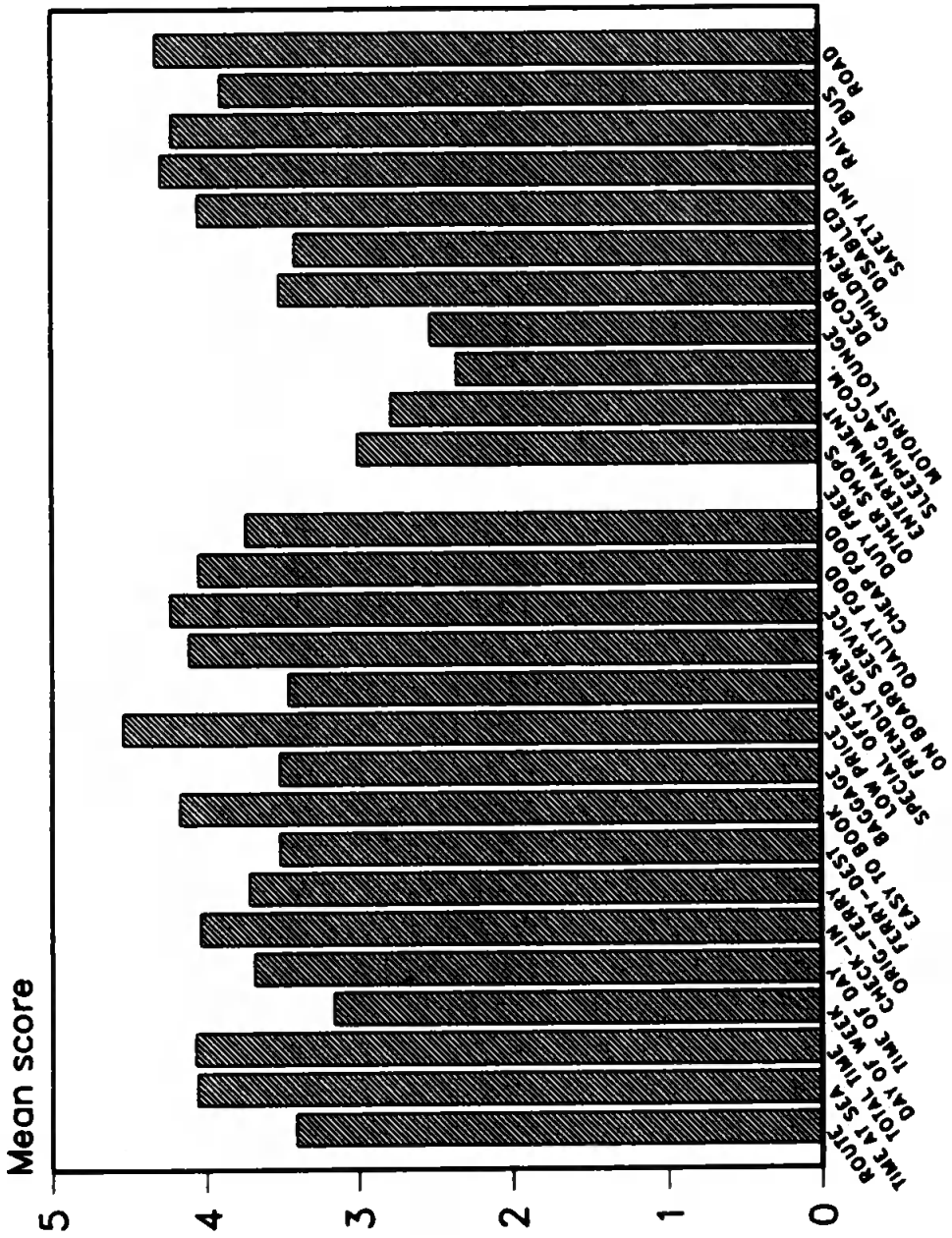
Figure 10.10: Mean scores for service attributes, Larne-Stranraer foot passengers

Table 10.26: Principal components for Larne-Stranraer foot Passengers

Principal component	service attributes loading >0.5	Components named
PC$_1$	Motorist fares, friendly attitude, Motorist lounge Decor, Facilities for children and disabled, safety	Minority group facilities
PC$_2$	Friendly attitude, good service and good food, cheap food	On board service at a reasonable price
PC$_3$	Check-in time required, Distance to and from origin and destination	Access time
PC$_4$	On board shops, Entertainment, sleeping accomodation	On board facilities
PC$_5$	Rail and Bus connections	Public transport
PC$_6$	Crossing and total travel time	Travel time
PC$_7$	Time and day of departure	Schedule

Travel time
33
7·8%

Convenience
75
17·8%

Standard of service
41
9·7%

Integrated
145
34·4%

Service unimportant
76
18·1%

Not time sensitive
51
12·1%

Figure 10.11: Size of benefit segments, Larne-Stranraer foot passengers

10.4.2 Benefit segment construction

Passengers are clustered on the factor scores to form 6 benefit segments (see figure 10.11). The mean factor scores for the segments are presented in table 10.27 and the umbrella diagrams for the segments are presented in figure 10.12. The segments have once again been labelled (see table 10.28) on the basis of the importance or lack of importance which they attach to various components. The segments developed here are dominated by public transport connections. Only 1 segment ('convenience') does not include public transport as either important or unimportant.

10.4.3 Profiling benefit Segments

The variables which differed significantly at the 0.05 confidence level according to a chi-squared test are as follows:

- Purpose of travel

Standard of service

Convenience

Travel time

Integrated

Not time sensitive

Service unimportant

1: Minority groups   3: Access time   5: Public transport   7:Schedule

2: On board service   4: On board facilities   6: Travel time

Figure 10.12: Larne-Stranraer foot passengers, umbrella diagrams

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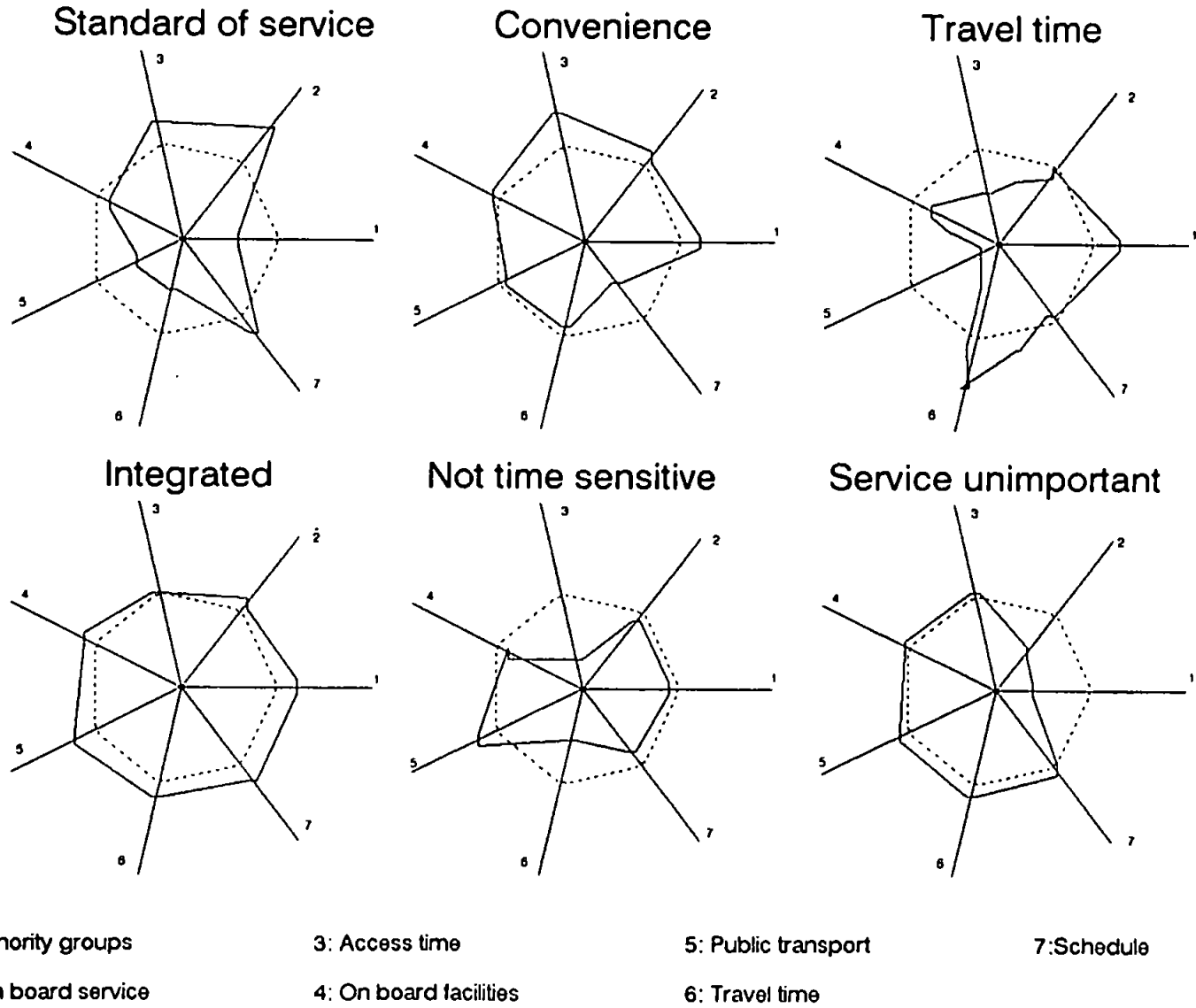
Table 10.27: Mean factor scores for segments: Larne-Stranraer foot Passengers. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (41)	Segment 2 (75)	Segment 3 (33)	Segment 4 (145)	Segment 5 (51)	Segment 6 (76)
Minority groups	-0.842	0.447	0.542	0.407	-0.173	-1.207
On board service	0.949	0.149	-0.108	0.183	-0.161	-0.981
Access time	0.531	0.766	-0.918	0.042	-1.352	0.068
On board facs.	-0.265	0.139	-0.445	0.291	-0.217	0.127
Public transport	-0.938	-0.112	-1.556	0.483	0.455	0.231
Travel time	-0.958	-0.151	1.081	0.295	-0.913	0.340
Schedule	0.439	-0.964	-0.111	0.461	-0.348	0.077

Table 10.28: Benefit segment labels: Larne-Stranraer foot passengers

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (41)	On board service at a reasonable price Schedule, minority facs.	Travel time Public transport	Standard of service
2 (75)	Access time Environment/minority facs	Schedule Travel time	Convenience
3 (33)	Travel time Environment/minority facs	Public transport Access time	Travel time
4 (145)	Public transport Schedule		Integrated
5 (51)	Public transport	Travel time Access time	Not time sensitive
6 (76)	Travel time Public transport	Envir./minority On board service	Service unimportant

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Table 10.29: Profile of the 'standard of service' segment, Larne-Stranraer foot passengers

54% on holiday/visit to friends and relatives
38% travel with friends
34% travel with one other person
19% travel in groups of more than 5 persons
44% aged between 15 and 24
76% are male
37% arrive at the port by rail
37% continue their journey by rail
62% are single

- Who the passenger is travelling with

- The number of passengers in the group

- Age

- Sex

- Marital status

- Means of arriving at the port

- Means of continuing the journey from the port.

The standard of service segment

The 'standard of service' segment contains a higher proportion of passengers travelling for holiday/visiting friends and relatives than expected. This segment has the highest proportions of passengers who travel with friends. In conjunction with this, a relatively high proportion travel with one other person. There are also higher than expected proportions travelling in groups of 5 persons or in groups of more than 10 persons. This segment appears to have a young age profile with a higher than expected proportion of passengers aged between 15 and 24. This 'standard of service' segment contains the highest proportion of male passengers and more single passengers than

Table 10.30: Profile of the 'convenience' segment, Larne-Stranraer foot passengers

23% on holiday only
19% travel for business
41% travel with their family
15% are aged over 55
56% are female
39% arrive at the port by bus
31% continue their journey by bus

expected. A higher than expected proportion of passengers use rail both to arrive at the port and also to continue their journey.

The Convenience segment

The 'convenience' segment (see table 10.30) has the highest proportion of passengers who are on holiday only and also a higher proportion of business passengers than expected. It has the highest proportion of passengers who are travelling with their family. This segment is the least likely to travel alone with higher than expected proportions in all group sizes, except for groups of five persons. It has a slightly older age profile with higher than expected proportions of passengers aged between 55-64 and over 64. This segment has the highest proportion of female passengers. It has the highest proportion of passengers who arrive at the port by bus and also passengers who continue their journey by bus.

The Travel time segment

The 'travel time' segment is the smallest segment among foot passengers on this route. It contains the highest proportion of passengers travelling for business (see table 10.31) Possibly in conflict with this is the highest proportion of passengers travelling with one other person and also the highest proportion of passengers travelling in groups of more than 10 passengers.

Table 10.31: Profile of the 'travel time' segment, Larne-Stranraer foot passengers

30% travel for business
36% travel with one other person, 15% in groups of > 10
31% travel with their family
73% are male
58% are married
45% arrive at the port by other means
31% continue their journey by other means

Table 10.32: Profile of the 'integrated' segment, Larne-Stranraer foot passengers

55% on holiday/visit to friends and relatives
36% travel with their family
55% are female
70% are male
13% travel in groups of 3, 19% in groups of 5
24% aged 35-44
22% arrive at the port by other means
35% continue their journey by car, 32% by rail

Also possibly in conflict with the relatively high proportion of business passengers, this segment has a higher than expected proportion of passengers who travel with their family. With regard to the age profile of this segment, there are lower than expected proportions in all age groups under 35 and higher than expected proportions in all groups over 35. In common with the 'service importance' segment, this segment also has a high proportion of male passengers. This 'travel time' segment has the highest proportion of married passengers. The lack of importance attached to public transport by this segment is reflected by the high proportions who arive at the port or continue their journey by some other means.

The Integrated segment

The 'integrated' segment, the largest on this route, is one of the three segments which give a high mean factor score to public transport. Schedule is the other important component in this segment. In common with the largest segments among car passengers, there are no negative mean factor scores in this segment. The 'integrated' segment (see table 10.32) contains a higher than expected proportion of passengers who are on for holiday/visiting friends and relatives. In contrast to the 'service important' segment, which also contains a high proportion of passengers on holiday/visiting friends and relatives, this segment has a higher than expected proportion of passengers who travel with their family. In common with the 'convenience' segment, which contains the highest proportion of passengers travelling with other members of their family, this 'integrated' segment also contains a higher than expected proportion of female passengers. These are the only two segments with a majority of female passengers. Also in common with the 'convenience' segment, higher than expected proportions of passengers travelling in groups of over 5 persons or in groups of three passengers were also found in this segment. There is also a higher proportion of passengers travelling with only one other person. With regard to the age profile the only noteable comment is that this segment contains the highest proportion of passengers aged between 35 and 44. In terms of marital status this segment has the highest of passengers who are neither single nor married. This is the only segment where the transport modes appear to differ between arrival at the port and the continuing journey from the port; fewer than expected passengers arrive at the port by either bus, rail or car with a higher proportion using some other means, higher than expected proportions use rail or a lift in a car to continue their journey.

The Not time sensitive segment

The 'not time sensitive' segment also attaches more importance to public transport. The two journey time related components, travel time and access

Table 10.33: Profile of the 'not time sensitive' segment, Larne-Stranraer foot passengers

31% travel for other reasons
47% travel alone
55% aged between 15 and 24
47% are female
47% are single
42% arrive at the port by rail
42% continue their journey by rail

Table 10.34: Profile of the 'service unimportant' segment, Larne-Stranraer foot passengers

54% on holiday/visit to friends and relatives
24% travel for other reasons
50% travel alone
84% are aged between 15 and 34
56% are male
78% are single
38% arrive at the port by car
37% continue their journey by car

time, are particularly unimportant to this segment. This segment (see table 10.33) contains the highest proportion of passengers travelling for reasons other than holiday or business. Almost half of passengers in this segment travel alone. The 'time unimportant' segment appears to be a young segment with slightly more female passengers than expected and also a higher proportion of single passengers. This segment could alternatively have been labelled the 'public transport' segment as this is the only factor which is given a positive mean factor score. Correspondingly, the segment contains the highest proportion of passengers who arrive at the port by rail and the same proportion continue their journey by rail.

The Service unimportant segment

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The 'service unimportant' segment also appears to have an integrated aproach to the ferry service with travel time and public transport connections being the two more important components. The segment may be particularly distinguished however by the low mean factor scores given to the environment/minority group facilities and on board service at a reasonable price components. This 'service unimportant' segment contains higher than expected proportions of passengers travelling for holiday/visiting friends and relatives (see table 10.34) or other reasons. The highest proportion of passengers travelling alone is found in this segment. In common with the previous segment, this 'service unimportant' segment also appears to have a young age profile. Lower than expected proportions of passengers are found in all age groups over 35. This segment contains a slightly higher proportion of male passengers than expected and the highest proportion of single passengers. The highest proportions of passengers who either arrive at the port by car or continue their journey by car are found in this segment. There is also a higher than expected proportion who continue their journey by rail.

10.5 Foot passengers on the Holyhead-DunLaoghaire route

The mean scores for service attributes are presented in figure 10.13. The most apparent difference between the pattern of mean service scores between foot passengers on the Larne-Stranraer and Holyhead-DunLaoghaire routes is the higher importance attached to special offers by Larne-Stranraer foot passengers.

10.5.1 Principal components analysis

Principal components analysis of the foot passengers on the Holyhead-DunLaoghaire route produces 7 components which together account for 59.3% of the vari-
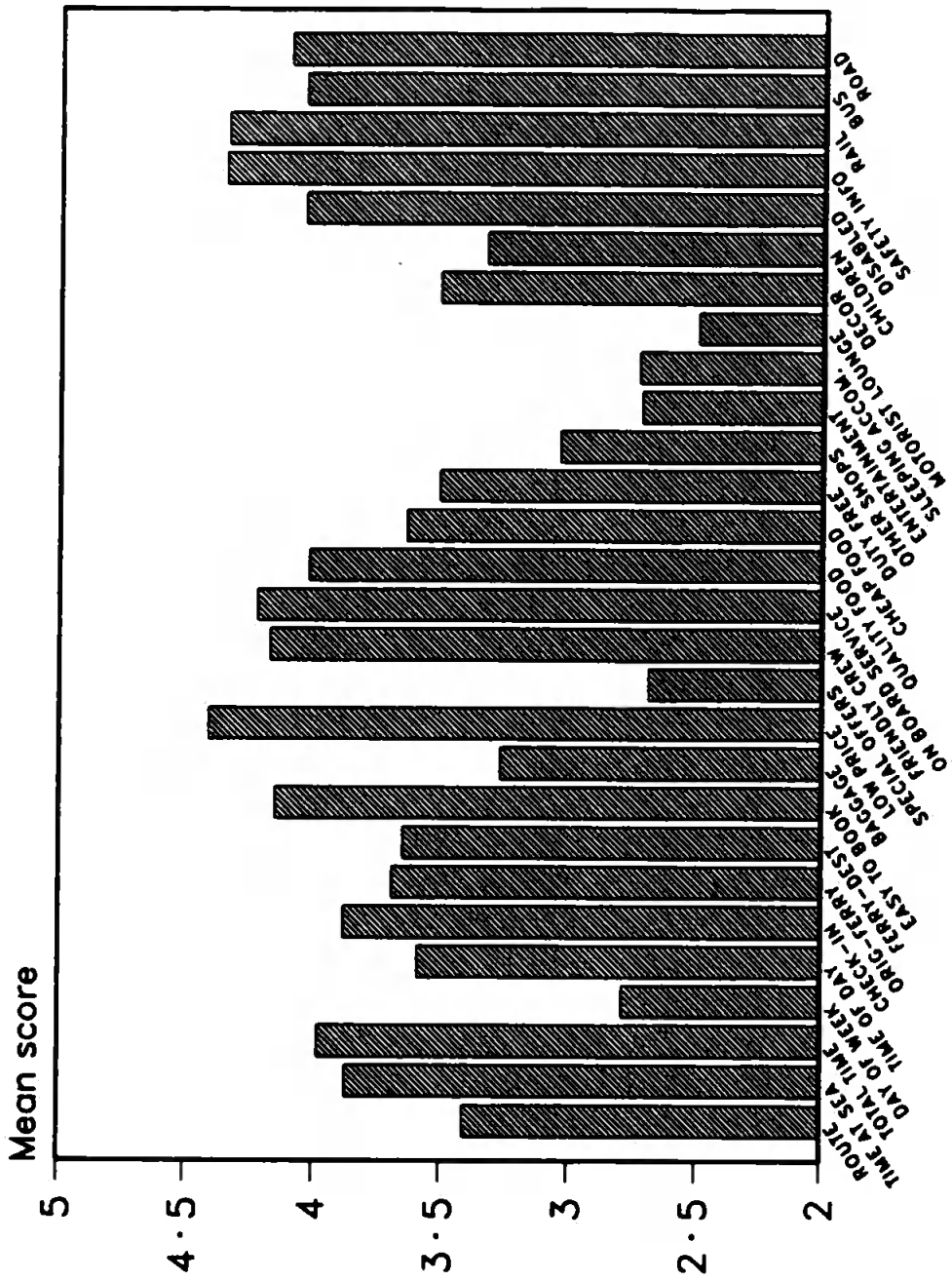
Figure 10.13: Mean scores for service attributes, Holyhead-DunLaoghaire foot passengers

Table 10.35: Principal components for Holyhead-DunLaoghaire foot passengers

Principal component	service attributes loading >0.5	Components named
PC$_1$	Friendly attitude, good on board service and food, decor, disabled facilities, safety information	Service/ environment
PC$_2$	Time required for check-in, distance to/from origin and destination, ease of booking	Access time
PC$_3$	Duty-free shops, other shopping facilities, entertainments	On board facilities
PC$_4$	Motorist fares and motorist lounge	Minority group facilities
PC$_5$	Rail and bus connections	Public transport
PC$_6$	Crossing and total travel time, route	Travel time (& route)
PC$_7$	Time and day of departure	Schedule

ance in this data set. The components, following rotation, are presented in table 10.35. It should again be noted that, in common with Larne Starnraer foot passengers, a price component has not emerged.

10.5.2   Benefit segment constrction

Clustering on the factor scores produces 6 segments with more than 10 members (see table 10.14). The mean factor scores for segments are presented in table 10.36 and the umbrella diagrams in figure 10.6. This again forms the basis for labelling segments (see table 10.37).
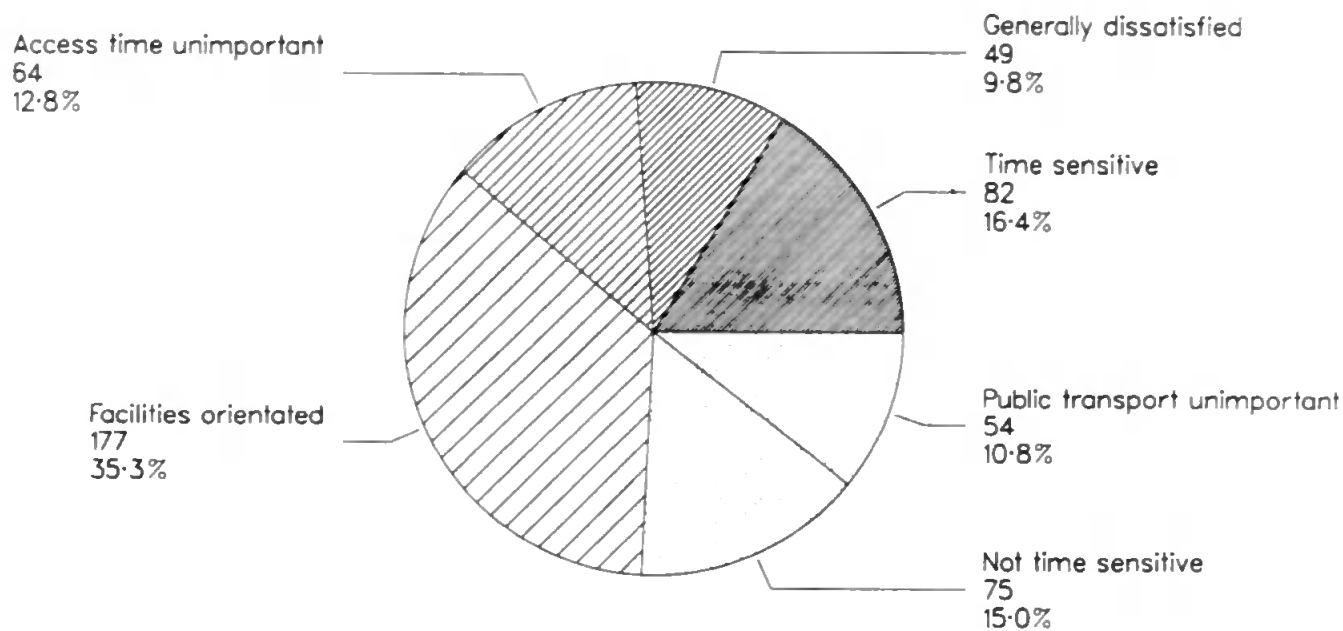
Figure 10.14: Size of benefit segments, Holyhead-DunLaoghaire foot passengers

Table 10.36: Mean factor scores for segments: Holyhead-DunLaoghaire foot passengers. Numbers in segments are given in brackets.

Component	Mean factor score					
	Cluster 1 (82)	Cluster 2 (49)	Cluster 3 (64)	Cluster 4 (177)	Cluster 5 (75)	Cluster 6 (54)
Service/environ.	-0.49	-1.846	0.635	0.271	-0.03	0.626
Access time	0.577	-0.999	-1.031	-0.008	0.414	0.424
On board facilities	-0.039	-0.381	-0.809	0.698	-0.175	-0.472
Minority facilities	-0.754	-0.213	0.076	-0.003	0.945	-0.442
Public transport	0.275	-0.705	0.359	0.295	0.36	-1.637
Travel time	0.353	-0.324	0.143	0.244	-0.997	0.09
Schedule	-0.802	0.114	-0.800	0.417	0.249	0.275

Time sensitive

Generally dissatisfied

Access unimportant

Facilities orientated

Not time sensitive

Public transport
unimportant

1: Service/environment   3: On board facilities   5: Public transport   7: Schedule
2: Access time   4: Minority group facilities   6: Travel time

Figure 10.15: Holyhead-DunLaoghaire foot passengers, umbrella diagrams
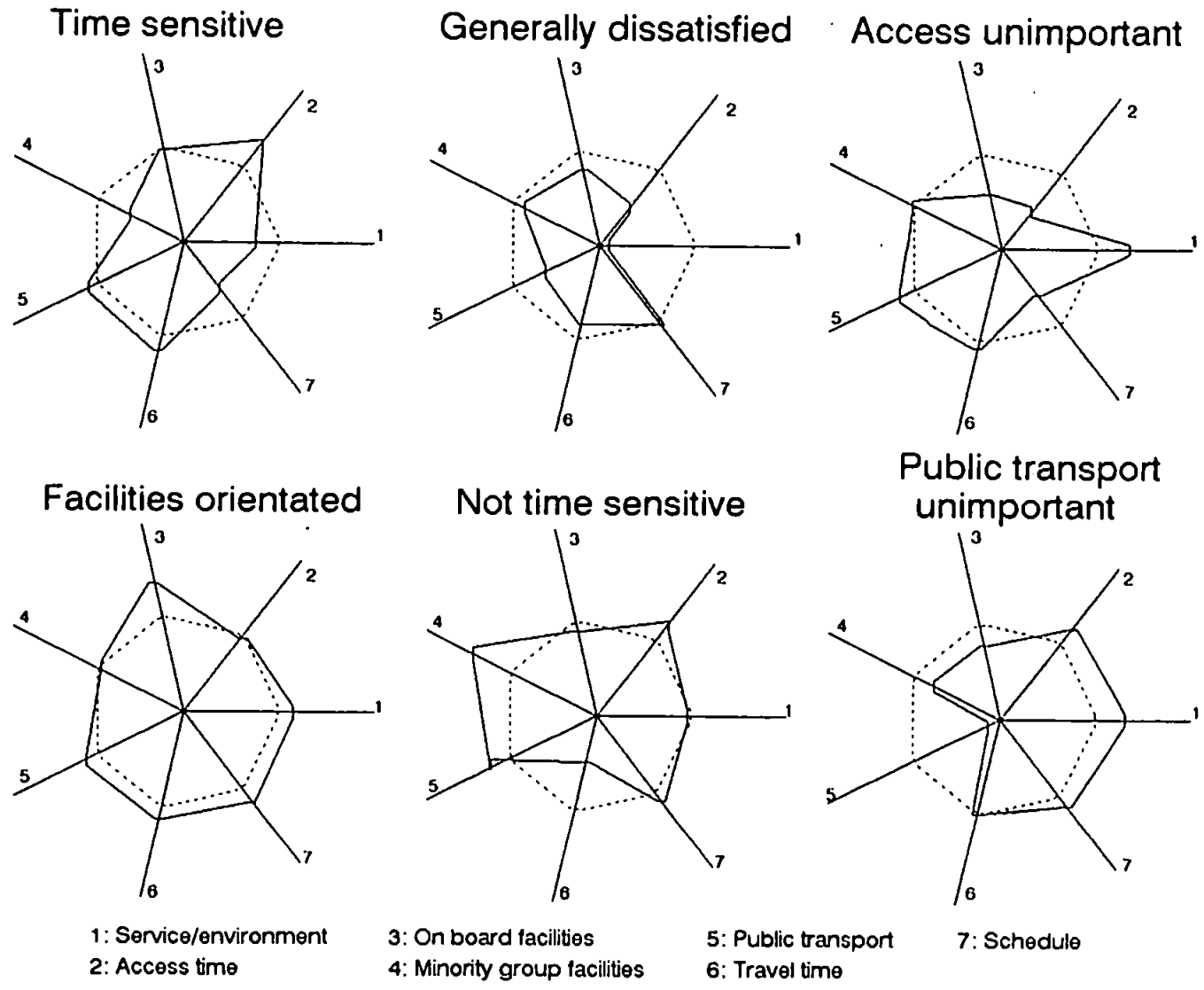
Table 10.37: Benefit segment labels: Holyhead-DunLaoghaire foot passengers

Segment no. and size of segment	Important components	Unimportant components	Label
1 (82)	Access time Travel time	Schedule Minority facilities	**Time sensitive**
2 (49)	Schedule (0.114)	Service/environment Access time	**Generally dissatisfied**
3 (64)	Service/environment Public transport	Access time On board facilities	**Access time unimportant**
4 (177)	On board facilities Schedule	Access time Motorist facilities	**Facilities orientated**
5 (75)	Motorist facilities Access time	Travel time (route) On board facilities	**Not time sensitive**
6 (54)	Service/environment Access time	Public transport On board facilities	**Public transport unimportant**

10.5.3   Profiling benefit segments

There are more differences between foot passengers segments on the Holyhead-DunLaoghaire route than on the Larne-Stranraer route. The variables which differ significantly, according to chi-squared, are as follows:

- Between surveys (seasonality)

- Departure time

- Purpose of journey

- Type of origin of journey

- Whether the passenger had used the service previously

- Who the passenger is travelling with

- How the passenger found out about the service

- Advance purchase time of tickets

- Age

- Sex

- Marital status

- Income

- Means of arriving at the port

- Means of continuing journey from the port

The larger number of discriminating variables suggests that segments in this data set are better defined.

Table 10.38: Profile of the 'time sensitive' segment, Holyhead-DunLaoghaire
foot passengers

35% travel in November, 29% in August
60% travel on the 0315 and 2045 sailings
46% travel for holiday/visit to friends and relatives
70% are repeat users
40% travel alone
60% know of the service through previous use
49% purchase tickets less than 24 hours in advance
82% are aged under 45
41% are married
23% have an income less than £5,000
45% arrive at the port by rail
53% continue their journey by rail

The Time sensitive segment

The 'time sensitive' segment (see table 10.38) contains the highest propor-
tion of passengers who travel in November. This is the first data set discussed
as yet where seasonal differences exist between segments. A higher propor-
tion of passengers than expected is also found in August. This segment may
have a tendency to use night crossings with higher than expected propor-
tions on the 0315 and 2045 sailings. It contains a relatively high proportion
of passengers travelling for a holiday/visit to friends and relatives. There is
also a higher proportion of business passengers than expected, although it
should be recalled that the level of business travel among foot passengers
on the Holyhead-DunLaoghaire route is generally low, accounting for less
than 10% overall. This segment contains a relatively high proportion of re-
peat users. The highest proportion of passengers travelling alone is found
in this segment. In conjunction with the higher proportion of repeat users
in this segment, repeat use accounts for how the majority of this segment
find out about the service. However, this segment also contains the highest
proportion of passengers who find out about the service through a recom-
mendation. It may be a feature of the high level of the familiarity with the

Table 10.39: Profile of the 'generally dissatisfied' segment, Holyhead-DunLaoghaire foot passengers

35% travel in May
67% travel on morning sailings (0315 and 0845)
14% travel for business
21% begin their journey from an other origin
39% purchase tickets less than week in advance
78% are male
65% are single
28% have an income over £25,000
43% arrive at the port by rail
47% continue their journey by rail

service that almost half the members of this segment purchase their tickets less than 24 hours in advance. Both this segment and the 'generally dissatisfied' segment appear to contain higher proportions of younger and middle-aged passengers. There are higher proportions of passengers than expected in all age groups under 45 and less than expected in all age groups aged over 45. The 'time sensitive' segment contains slightly more married passengers than expected With respect to income, this segment has a fairly high proportion of passengers with an income less than £5000 pa. Lower proportions of passengers than expected are found in the two higher income categories. Somewhat surprisingly, in view of the mean factor score attached to the public transport factor, this segment contains the highest proportions of passengers who arrive at the port by rail and passengers who continue their journey from the port by rail.

The Generally dissatisfied segment

The 'generally dissatisfied' segment is the smallest segment among foot passengers on this route and conforms to the pattern already noted of small segments having a predominance of negative mean factor scores. In the 'generally dissatisfied' segment (see table 10.39) a higher proportion of passengers than expected travel in the May. There are more passengers on the

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two morning sailings than expected. This segment contains the highest proportion of business travel although as already noted the business component among foot passengers on the Holyhead-DunLaoghaire route is small. There is also a higher proportion of passengers on holiday, without a visit to friends or relatives, than expected. The highest proportion of passengers who begin their journey from some place other than their normal residence, relative's home, place of holiday or place of business is found in this segment. In common with the 'time sensitive' segment, the 'generally dissatisfied' segment has a fairly short booking horizon, with the highest proportion of passengers who purchase tickets less than 1 week in advance. The common age and sex characteristics of this segment with the 'time sensitive' segment have already been noted. Continuing with demographic and socio-economic characteristics, this segment contains the highest proportion of male passengers and also a high proportion of single passengers. In contrast to the 'time sensitive' segment however, there are higher than expected proportions of passengers in both the higher income categories, although the relatively high proportion of passengers in the less than £5000 income category should be noted. This 'generally dissatisfied' segment also contains relatively high proportions of passengers who arrive at the port by rail and those who continue their journey by rail.

The access time unimportant segment

The highest proportion of passengers surveyed in August is found in the 'access time unimportant' segment (see table 10.40). Afternoon and evening travel is more prevalent among this segment. This 'access time unimportant' segment contains a higher than expected proportion of passengers on holiday/visiting friends and relatives and also a higher proportion of passengers travelling for 'other' reasons. This segment contains the highest proportion of repeat users of the service and in conjunction with this, the highest proportion of passengers who find out about the service through

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Table 10.40: Profile of the 'access time unimportant' segment, Holyhead-DunLaoghaire foot passengers

```
36% travel in August
51% travel on afternoon and evening sailings
41% travel for a holiday/visit to friends and relatives
77% are repeat users
62% knew of the service from previous use
42% travel with their family, 38% alone
27% purchase tickets more than 3 weeks in advance
62% are aged over 35
55% are married
77% have an income less than £20,000
31% do not arrive by public transport
30% do not continue their journey by public transport
```

previous use. The 'access time unimportant' segment contains the highest proportion of passengers travelling with their family and there is also a fairly high proportion of passengers travelling alone. In contrast to the 'time sensitive' segment, which also has a high proportion of repeat users and it was suggested that familiarity with the service may have encouraged a short booking horizon, the 'access time unimportant' segment had a longer booking horizon with a higher than expected proportion of passengers purchasing tickets more than 3 weeks in advance of travel. With respect to demographic and socio-economic characteristics, the 'access time unimportant' segment has an older age profile with lower than expected proportions of passengers in all age groups under 35 and higher than expected proportions in all age categories over 35. Possibly in conjunction with the older age profile, this segment has a relatively high proportion of married passengers. In conflict, perhaps, with the age profile lower than expected proportions of passengers are found in all income categories over £20,000.

The Facilities orientated segment

The 'facilities orientated' segment is the largest segment among foot passen-

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Table 10.41: Profile of the 'facilities orientated' segment, Holyhead-DunLaoghaire foot passengers

57% travel in off peak seasons (Nov and Feb)
58% travel on night-time sailings (2045 and 0315)
48% travel for holiday/visit to friends and relatives
42% are aged between 15 and 24
56% are female
63% are married
25% arrive at the port by car
47% continue their journey by rail

gers on the Holyhead-DunLaoghaire route. It appears to show bias towards off-peak travel (see table 10.41) having the highest proportion of passengers travelling in February and a higher than expected proportion in November. More members of this segment, in common with the 'travel time' sensitive segment, travel on the night-time sailings. This segment contains the highest proportion of passengers on holiday/visiting friends and relatives. The 'facilitites orientated' segment appears to have the youngest age profile among foot passenger segments on this route with the highest proportion of passengers aged between 15 and 24. There are lower than expected proportions in all age categories over 25. This segment is one of only two to have a majority of female passengers and there is a higher proportion of married passengers than expected, which is surprising given the young age profile. The highest proportion of passengers to arrive at the port by car is found in this segment. While there is again a higher than expected proportion of passengers who continue their journey by car there is also a higher than expected proportion who continue their journey by rail.

The Not time sensitive segment

The 'not time sensitive' segment (see table 10.42) may also be biased towards off-peak travel with a lower proportion of passengers found in August. More passengers in this segment travel on the 0845 and 1445 sailings. This seg-

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Table 10.42: Profile of the 'not time sensitive' segment, Holyhead-DunLaoghaire foot passengers

55% travel in off-peak seasons
63% travel on day time sailings
41% travel for holiday only
47% are first time users
36% travel with friends
60% are female
66% are single
low to mid-range incomes
41% arrive at the port by bus
42% continue their journey by bus, 44% by rail

ment contains more holiday only passengers and fewer passengers travelling for holiday/visit to friends and relatives, business or other reasons than expected. In contrast to the segments considered as yet on this route, in particular the 'time sensitive' and the 'access time unimportant' segments, this 'not time sensitive' segment contains the highest proportion of first time users of the service. It also contains the highest proportion of passengers travelling with friends. This is the other segment (in addition to the 'facilities orientated' segment) in which female passengers are predominant, but in contrast to the 'facilities orientated' segment, this segment has the highest proportion of single passengers. The 'not time sensitive' segment has a low-mid income profile. A higher than expected proportion of this segment arrive at the port by bus. Relatively high proportions continue their journey by bus or by rail.

The Public transport unimportant segment

The last segment to be discussed for foot passengers on this route has been termed the 'public transport unimportant' segment. This segment appears to be more orientated towards peak season travel (see table 10.43) with higher than expected proportions of passengers being found in both August and May. Passengers in this segment appear to favour day crossings with the

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Table 10.43: Profile of the 'public transport unimportant' segment, Holyhead-DunLaoghaire foot passengers

```
69% travel peak season (Aug and May)
81% travel on day-time sailings
63% are on holiday only
49% begin their journey from a place of holiday
50% are first time users
41% travel with their family
35% learn of the service from a travel agent
30% purchase tickets more than 3 weeks in advance
41% purchase tickets less than 1 week in advance
76% are aged over 35
65% are maried
47% have an income over £25,000
43% arrive at the port by bus
50% continue their journey by bus
```

highest proportions travelling on the 0845 and 1445 sailings. The purpose of travel in this segment is predominantly holiday only and this segment has the highest proportion of passengers who begin their journey from their place of holiday. It contains the highest proportion of first time users of the service, but in contrast to the 'not time sensitive' segment which also has a high proportion of first time users, this segment has a higher proportion of passengers who are travelling with their family. It has the lowest proportion of passengers travelling alone. Probably reflecting the high proportion of first time users, this segment contains the highest proportion of passengers who find out about the service from a travel agent. Again possibly aligned to the lower level of familiarity with the service, this segment has the highest proportion of passengers who purchase tickets more than three weeks in advance. In contrast to this however, there is also a significant short booking element in this segment. In common with the 'access time unimportant' segment, the 'public transport unimportant' segment also has an older age profile and again age 35 appears to act as a cut-off point with lower than expected proportions of passengers aged below 35 and higher than expected proportions aged over 35. In conjunction with the older age profile, this

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segment has the highest proportion of married passengers. This segment has the highest income profile among foot passenger segments on this route, with the highest proportions of passengers in the £25-40,000 and over £40,000 income categories. The predominance of holiday only passengers, the older age profile and higher income profile, coupled with the occurrance of the highest proportions of passengers who arrive at the port by bus and those who continue their journey by bus may suggest that this segment contains a significant number of coach tour passengers.

10.6 Foot passengers on the Fishguard-Rosslare route

The mean scores on service attributes for foot passengers on the Fishguard-Rosslare route are presented in figure 10.16. The service attribute profile for Fishguard-Rosslare foot passengers is again similar to that for foot passengers on the other two routes. One feature which emerges is that the mean score for road connections appears to be higher than the mean score for either rail or bus connections. However, when the pattern of mean service attribute scores for car and foot passengers on this route are compared, it is apparent that foot passengers do rate the public transport connection more highly.

10.6.1 Principal components analysis

Principal components analysis of this data set produces 7 components which account for 61.9% of the variance. This is the highest percentage of variance explained by principal components for foot passengers, although 7 components are developed on all routes. The components, following rotation are presented in table 10.44. Price contributes to a component on this route, in contrast to the other two routes.
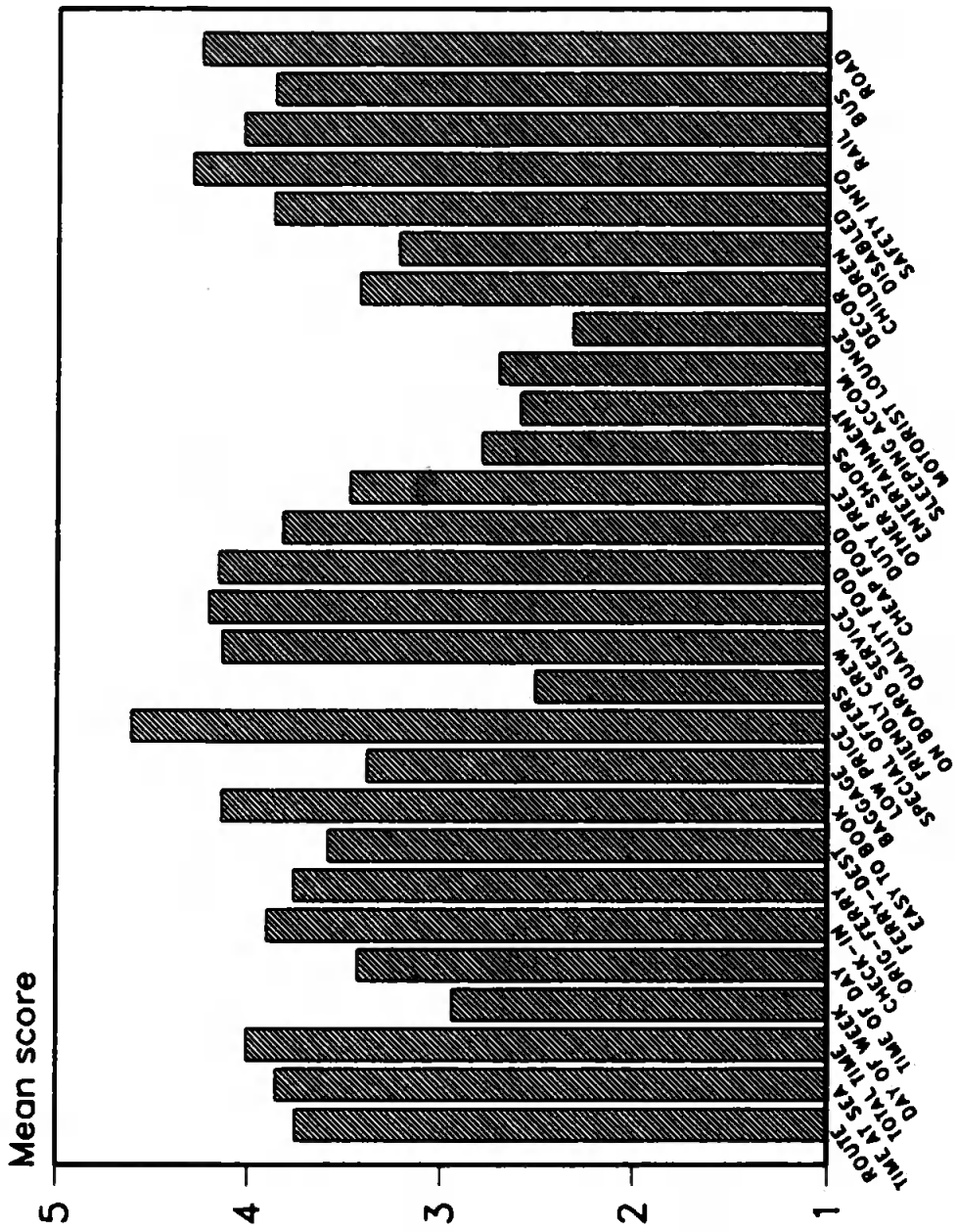
Figure 10.16: Mean scores for service attributes, Fishguard-Rosslare foot passengers

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Table 10.44: Principal components for Fishguard-Rosslare foot passengers

Principal component	service attributes loading >0.5	Components named
PC$_1$	Friendly attitude, good service and food facilities for disabled and safety information	On board service/ environment
PC$_2$	Distance to and from origin and destination, ease of booking, baggage handling facilities	Access (time)
PC$_3$	Motorist fares, motorist lounge, facilities for children	Minority group facilities
PC$_4$	Cheap food, duty-free and other shops	Value for money facilities
PC$_5$	Rail and Bus connections . Price	Price/ Public transport
PC$_6$	Crossing and total travel time, route	Travel time
PC$_7$	Time and day of departure	Schedule
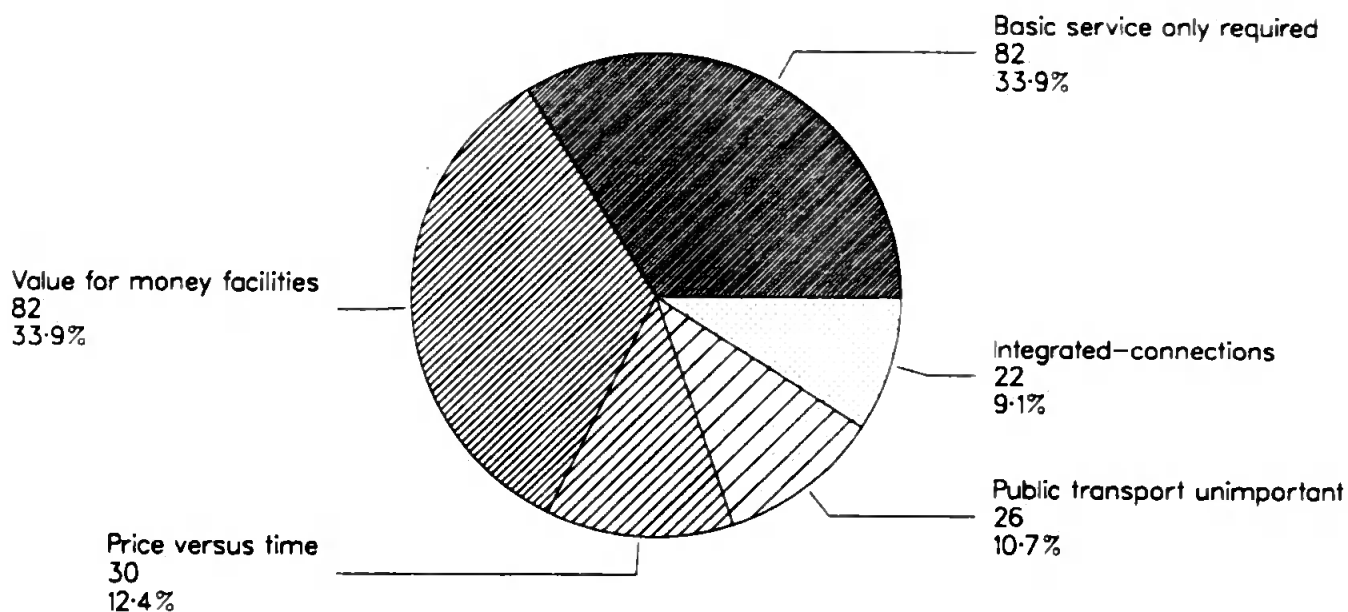
Figure 10.17: Size of benefit segments, Fishguard-Rosslare foot passengers

10.6.2 Benefit segment construction

Passengers are clustered on the factor scores to form 5 benefit segments (see table 10.17), less than on the other two routes. The mean factor scores for segments are presented in table 10.45 and the umbrella diagrams in figure 10.18. The segments have once again been labelled (see table 10.46) on the basis of the importance or lack of importance which they have attached to various components.

10.6.3 Profiling Benefit Segments

It should be noted that the segment sizes in this data set are comparatively small and therefore there may be some difficulty in interpreting profile results.

The variables which differ significantly between all segments, according to chi-squared, analysis are as follows:

Table 10.45: Mean factor scores for segments: Fishguard-Rosslare foot passengers. Numbers in segments are given in brackets.

Component	Mean factor score				
	Segment 1 (33)	Segment 2 (82)	Segment 4 (30)	Segment 5 (26)	Segment 6 (22)
Service/environment	-1.615	0.276	0.168	0.556	0.026
Access (time)	-0.156	0.340	-0.097	0.423	-1.261
Minority groups	-0.681	0.186	-0.678	-0.437	0.314
Value for money facilities	0.035	0.713	-0.686	-0.443	-1.040
Price/PT	-0.237	0.252	0.692	-1.547	0.431
Travel time	-0.326	-0.100	0.456	0.140	0.290
Schedule	-0.122	0.320	-0.833	-0.115	0.859

Table 10.46: Benefit segment labels: Fishguard-Rosslare foot passengers

Segment no. and size of segment	Important components	Unimportant components	Segment Label
1 (33)	(Value for money facilities)	On board service/ environment Minority group facs	Basic service only required
2 (82)	Value for money facilities Access (time)	Route/travel time Travel time	Value for money facilities
4 (30)	Price/public transport Route/travel time	Schedule Value for money facilities	Price *versus* time (deal prone?)
5 (26)	On board service/envir. environment Access (time)	Price/Public transport Value for money facilities	Public Transport unimportant
6 (22)	Schedule Price/public transport	Access (time) Value for money facilities	Integrated-connections

Basic service

Value for money

Price versus time

Public transport unimportant

Integrated

1: Service/environment
2: Access (time)
3: Minority groups
4: Value for money facilities
5: Price/public transport
6: Travel time
7: Schedule

Figure 10.18: Fishguard-Rosslare foot passengers, umbrella diagrams

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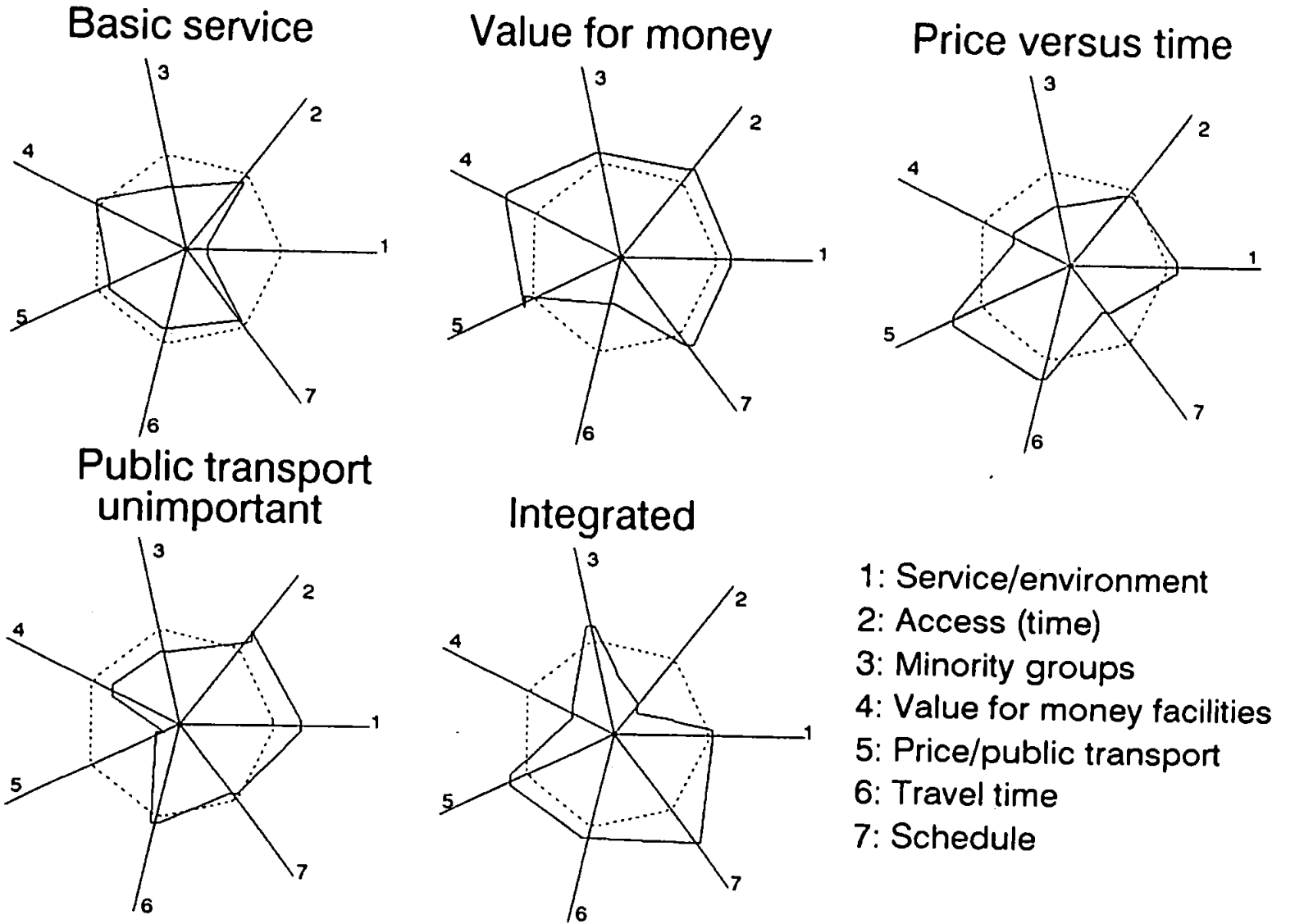
Table 10.47: Profile of the 'basic' segment, Fishguard-Rosslare foot passengers

44% on holiday only
46% are aged 15-24
67% are single
33% have an income over £25,000

- Purpose of journey

- Age

- Marital status

- Income

The Basic segment

The 'basic' segment has a positive mean component score for one factor only, value for money facilities. This is not however the smallest segment on this route. The 'basic' segment (see table 10.47) contains slightly more passengers travelling for holiday only than expected and fewer than expected travelling for either holiday/visit to friends and relatives, business or other reasons. This segment has a very young age profile with lower than expected proportions of passengers in all age groups over 25. Complementing the young age profile, members of the 'basic' segment are predominantly single. In contrast to the relationship between age and income profiles which has been hinted at previously, where young age profile and a low income profile seem to belong to the same group, this segment contains the highest proportions of passengers in the two higher income categories. However the small numbers involved means that this pattern should be treated with caution.

The value for money facilities segment

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Table 10.48: Profile of the 'value for money facilities' segment, Fishguard-Rosslare foot passengers

49% on holiday/visit to friends and relatives
33% are aged between 15 and 24
49% have an income under £10,000

Table 10.49: Profile of the 'price *versus* travel time' segment, Fishguard-Rosslare foot passengers

63% on holiday/visit to friends and relatives
43% are aged between 25 and 34
53% are single
26% have an income under £5,000

The largest segment to emerge from cluster analysis is again a facilities orientated segment, the 'value for money facilities' segment. This segment (see table 10.48) contains more passengers on holiday/visit to friends and relatives than expected. This segment also appears to have a younger age profile. The 'value for money facilities' segment has a lower income profile with over half of the members of this segment having an income of less than £10,000.

The Price *versus* travel time segment

The 'price *versus* travel time' segment (see table 10.49) is dominated by holiday/visiting friends and relatives passengers. The age profile appears to be slightly older than for the previous two segments. A slight majority of these passengers are single. This again appears to be a lower income segment having the highest proportion of members with an income less than £5,000 pa.

The Public transport unimportant segment

Table 10.50: Profile of the 'public transport unimportant' segment, Fishguard-Rosslare foot passengers

62% on holiday only
50% are aged over 55
75% are married
14% have an income under £10,000

Table 10.51: Profile of the 'integrated connections' segment, Fishguard-Rosslare foot passengers

55% on holiday only,18% on business
45% are aged between 25 and 34
62% are married
71% have an income over £15,000

In contrast, the 'public transport unimportant' segment (see table 10.50) contains very few passengers on holiday/visit to friends and relatives passengers but is dominated by holiday only traffic. This 'public transport unimportant' segment has the oldest age profile among foot passengers on this route. It is largely composed of married passengers. Again in contrast to the previous 2 segments, this segment appears to have a higher income profile with fewer than expected passengers found in the low income groups. These combined features of this segment may support the premise that this is the coach tour segment on this route.

The Integrated connections segment

The smallest segment among foot passengers on the Fishguard-Rosslare route, the 'integrated connections' segment has only 22 members. It contains (see table 10.51) a slight majority of holiday only traffic and has the highest proportion of business passengers. The highest proportion of passengers in this segment fall in the age group 25-34 and there are more passengers than expected in all age categories over 45. The majority of passengers in

this segment are married. There are lower than expected proportions in all income groups up to £15,000.

10.7 Summary

10.7.1 Principal components analysis

Car passengers

Seven factors which are common between routes emerge from principal components analysis of car passengers:

- Minority group facilities

- On board service (/environment)

- On board facilities

- Access (time)

- Price (cost)

- Travel time

- Schedule

These factors determine choice of service on all routes for car passengers. An eighth factor, majority group facilities, is also developed for car passengers on the Larne-Stranraer and Fishguard-Rosslare routes and a ninth (negative) factor, route, on the Fishguard-Rosslare route.

Principal components are developed to account for, or explain, variance in the data. If the principal components are used to represent areas of difference between passengers they may provide useful insights to management in the development of the competitive strategy. Some of the competitive areas

identified by principal components analysis will be actionable by the company in the short-term, some in the medium-term and there will be some that are unlikely to be addressed by the company, even in the long-term. Improvement in existing facilities might be a short-term tactic but establishment of new facilities is likely to be part of a medium-term strategy. An example of new facilities for minority groups is the recent provision of children's play areas on all three routes. The ferry operator may also be able to influence travel time and schedule, although probably only marginally. These two components might be more important in long-term strategies, for example, the establishment of a new route. The operator has little opportunity to influence the access component of service choice. This illustrates the importance of the place element of the marketing mix and its close inter-relationship with product when the marketing mix model is applied to transport services.

The existence of at least 1 segment on each route for whom price is not important does not refute the operator's assertion that price is the *major* basis for competition. It does however, highlight the fact that price is not the foremost concern for *all* car passengers. The operator will have to compete for these passengers on some other platform. On the Larne-Stranraer route almost one third of car passengers are not price sensitive.

Foot passengers

Seven factors, or components, are also developed for foot passengers on all routes. These 7 components represent the elements of the service choice decision for foot passengers:

- minority group facilities

- on board service (at a reasonable price)

- access time

- on board facilities

- public transport

- travel time

- schedule

The Fishguard-Rosslare route is the only route where price is included in a factor (the public transport factor). The main difference between principal components for car and foot passengers appears to be that a price/cost component emerges in for car passengers, but not for foot passengers which have a public transport factor. Public transport attributes (ie bus and rail connections) are included in the minority group facilities component for car passengers. That a price component has not emerged for foot passengers does not indicate a lack of importance attached to this attribute, but rather a lack of variation in the score given to the price attribute. Inspection of the mean score profiles for service attributes for foot passengers on the three routes shows that the low cost attribute (no. 11) has the highest mean score of all attributes. Therefore the low cost of the ferry service is an important consideration for all foot passengers and may well the major basis for competition in this part of the market.

10.7.2 Benefit segment construction

Having determined factors influencing service choice it was envisaged that, despite the common core of factors influencing choice, the relative importance of these factors would vary between passengers, for example, price and time might be more important to one passenger (or group of passengers) while access time and schedule might be more important to another.

Car passengers

For car passengers, two benefit segments are common to all routes; a facilities orientated segment and a value for money or a price sensitive segment. There

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is also a convenience segment which is common to the Larne-Stranraer and Holyhead-DunLaoghaire routes and a travel time segment which is found on both the Holyhead-DunLaoghaire and Fishguard-Rosslare routes.

Foot passengers

Benefit segments differ between routes to a greater degree for foot passengers than they do for car passengers. There are no segments common to all routes for foot passengers although there is a segment on all routes which attaches less importance to the onboard service factor.

The integrated (Larne-Stranraer) and facilities orientated (Holyhead-DunLaoghaire) segments are similar in that they have positive mean factor scores for all factors and they are the largest segment on the route.

The public transport component features in the majority of foot passenger benefit segments as either important or unimportant. Looking at this in conjunction with preliminary analysis, over half the foot passengers on all routes use public transport to either arrive at or continue their journey from the ports. Bus is more important on Fishguard-Rosslare, rail on Holyhead-DunLaoghaire and roughly equal proportions of each on Larne-Stranraer. In general, public transport is more important on the Holyhead-DunLaoghaire and Fishguard-Rosslare routes as a higher proportion of passengers receive lifts in cars on the Larne-Stranraer route. This highlights the importance of the symbiotic relationship required between the ferry operator and the operators of rail and bus/coach services to be able to offer complementary or combined services.

10.7.3 Profiling benefit segments

Car passengers

The previous section concludes that a facilities orientated segment exists for car passengers on all three routes. It is suspected that these segments would also display common features at the profiling stage. However, purpose of journey and sex of the passenger are the only two variables employed in profiling benefit segments for car passengers on all three routes. The facilities orientated segments on Holyhead-DunLaoghaire and Fishguard-Rosslare have higher proportions of passengers on holiday/visiting friends and relatives, although the Larne-Stranraer facilities orientated segment does not. However, facilities orientated segments on the three routes do have higher proportions of female passengers. Further research should investigate the proportion of females, belonging to the facilities orientated segments, who are travelling with their family and particularly, how many children and of what age are in the group.

Foot passengers

Demographic variables, age sex and marital status are common profiling variables on all routes. Age and marital status also show seasonal differences on all routes. Relatively few profiling variables differ significantly between segments on Larne-Stranraer and Fishguard-Rosslare routes with rather more on the Holyhead-DunLaoghaire route, including seasonality. This is the only evidence of seasonal variation in benefit segments for sea passengers.

Performance of profiling variables

Overall, travel behaviour variables are more useful in profiling segments, followed by demographic variables. Buying behaviour variables are relatively

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unhelpful in identifying areas of difference between benefit segments. Car passengers on the Fishguard-Rosslare route is the only data set where more buying behaviour variables, than travel behaviour or demographic variables are employed in profiling benefit segments.

Chapter 11

Benefit segment construction and profiling in the air passenger market

Benefit segmentation analysis in the air passenger market is also performed on 6 subsets of the data, business and non-business passengers at each airport. This maintains compatiblity with the treatment of the sea passenger market and increases the relevence of the findings to management. Airport managers are more concerned with the needs of passengers at their airport (and from a competitive viewpoint with the needs of passengers at other airports) than with a general view of the market.

11.1 Non-business air passengers at Belfast City airport

The pattern of mean scores for service attributes for non-business passengers at Belfast City airport is presented in figure 11.1. There are 22 services attributes for this airport as an additional attribute, 'friendly atmosphere

of a small airport', is included at the request of the airport management. This attribute appears to have been considered to be moderately important. Other attributes which appear to be more important are 'ease of booking', low price', 'availability of discount fares' and friendly attitude of crew and staff'. Less important attributes are day of week of flight', 'in-flight entertainment' and facilities for children and disabled persons.

11.1.1 Principal components analysis

Principal compoments analysis of this data set results in 6 components which together account for 64.5% of variance. The components, following varimax rotation are presented in table 11.1. It may be noted at this stage the components developed are similar to those developed for ferry passengers.

11.1.2 Benefit segment construction

Clustering on the factor scores produces only 4 segments (see table 11.2), with more than 10 members. The mean factor scores for segments are presented in table 11.2 and the umbrella diagrams in figure 11.3. Once again the mean factor scores of segments are used as the basis for labelling segments, with the two highest and two lowest mean factor scores being particularly important in labelling. The labelled segments are presented in table 11.3. Public transport connections and price are the two components which feature most highly among the segments.

11.1.3 Profiling benefit segments

Very few differences are found to exist between the benefit segments for non-business passengers at this airport. The only variable which differs significantly between all 4 benefit segments, according to chi-squared, is the age of the passengers (see figure 11.4). The 'integrated' segment appears to

Figure 11.1: Mean scores for service attributes, non-business passengers at Belfast City airport

Table 11.1: Principal components for non-business passengers at Belfast City airport

Principal component	service attributes loading >0.5	Components named
PC$_1$	Baggage handling, good food, in flight entertainment, decor, facilities for children and disabled	Flight facilities
PC$_2$	Ease of booking, child facilities, safety, good road connections	access/convenience additional facs
PC$_3$	Flight and total travel time distance to and from origin and destination	Total travel time
PC$_4$	Price and discount fares	Price
PC$_5$	Rail and bus connections	Public transport connections
PC$_6$	Time and day of departure	Schedule

Table 11.2: Mean factor scores for segments: non-business passengers at Belfast City airport. Numbers in segments are given in brackets.

Component	Mean factor score			
	Segment 1 (92)	Segment 2 (58)	Segment 4 (44)	Segment 6 (52)
In flight facs	-0.048	-0.031	0.301	-0.294
Access/conv	-0.034	0.069	0.168	-0.057
Travel time	0.374	-1.219	0.269	0.532
Price	0.157	0.315	-0.357	0.268
Connections	0.608	-0.101	0.602	-1.351
Schedule	0.582	0.147	-1.362	-0.229
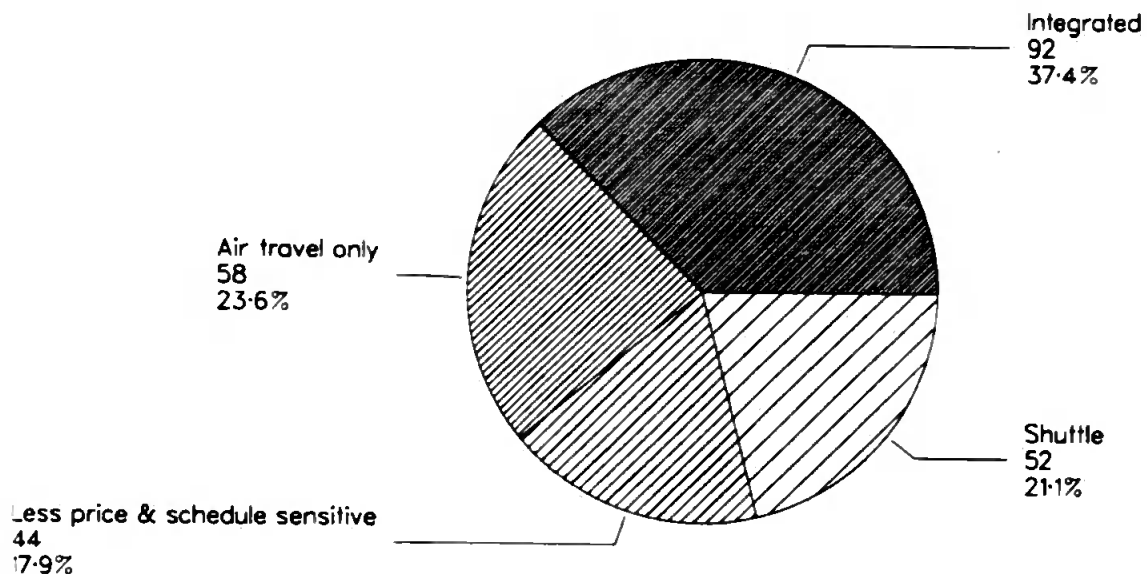
Figure 11.2: Size of benefit segments, Belfast City airport non-business passengers

Table 11.3: Benefit segment labels: non-business passengers at Belfast City airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (92)	Public transport connections, Schedule	In flight facilities Access/convenience	Integrated
2 (58)	Price, Schedule	Travel time Public transport	Air travel only
4 (44)	Public transport connections, In flight facilities	Schedule, Price	Less price and schedule sensitive
6 (52)	Travel time, Price	Public transport In flight facilities	Shuttle

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Integrated

Air travel only

Less price and
schedule sensitive

Shuttle

1: In flight facilities
2: Access/convenience
3: Travel time
4: Price
5: Connections
6: Schedule

Figure 11.3: Belfast City airport non-business passengers, umbrella diagrams

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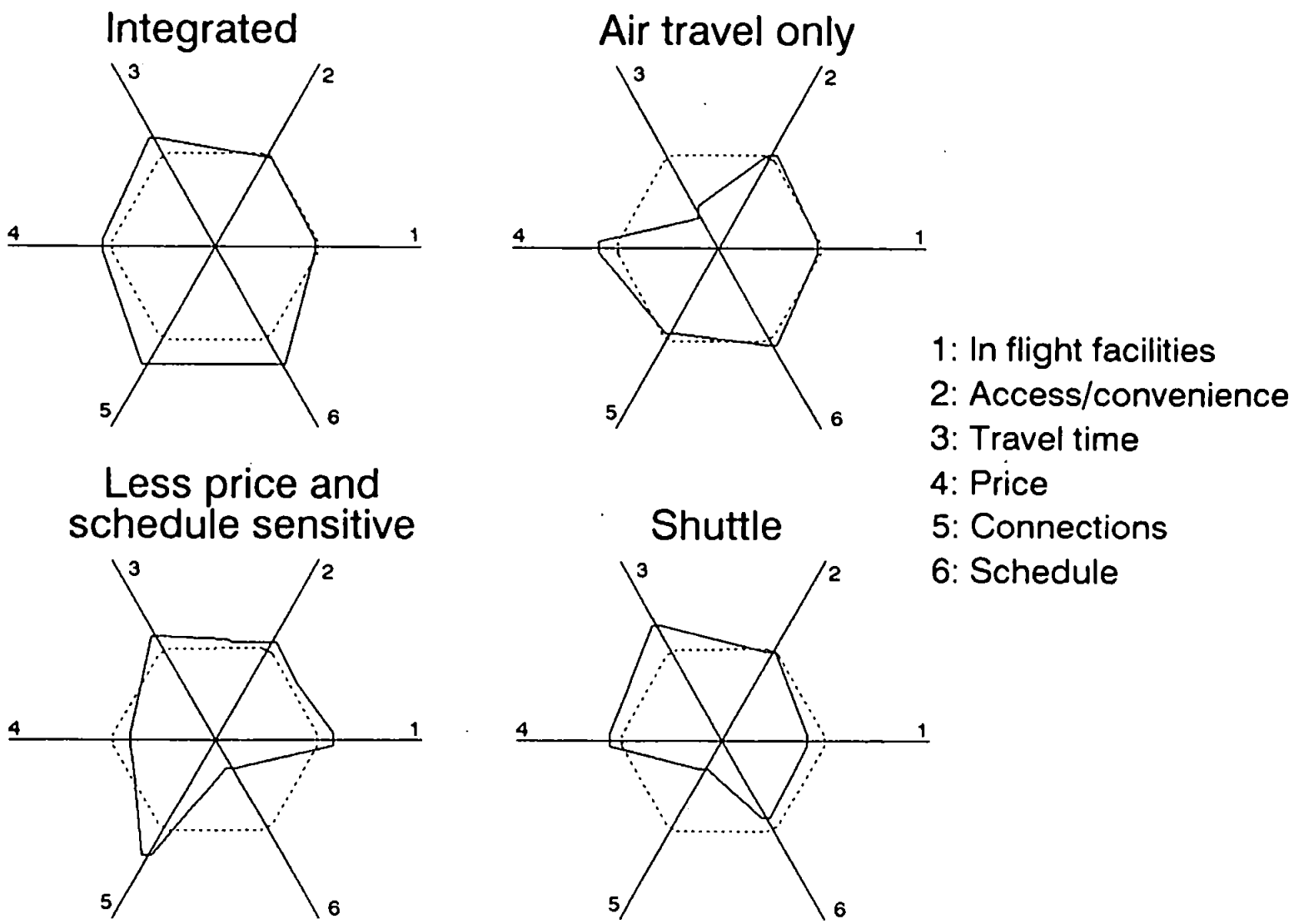
have a slightly younger age profile with higher proportions of this segment than expected in age groups under 55 years and lower than expected proportions in the age categories over 55. The 'air only' segment contains higher proportions of passengers than expected in the 15-24, 45-54 and over 65 age groups. The 'not price or schedule sensitive' segment also has a younger age profile with the highest proportions in the 15-24 and 35-44 age groups. The age group best represented among the 'shuttle' segment is the 25-34 group. This segment also contains the highest proportion of passengers in the two older age groups.

11.2 Non-business air passengers at Belfast International airport

The pattern of scores for the service attributes is presented in figure 11.5. This follows the pattern established by non-business passengers at Belfast City Airport. The low price attribute does not appear to be quite so dominant at Belfast International Airport and is matched in importance by friendly attitude of crew and staff.

11.2.1 Principal components analysis

Principal components analysis results in 6 components which account for 63.6% of the variance. The components, following varimax rotation, are presented in table 11.4. The components developed for non-business passengers at Belfast International airport are largely the same as those developed at Belfast city airport. The ordering of the components is different but as the matrices have been rotated this is not important.

Figure 11.4: Age profiles for Belfast City airport non-business passengers segments
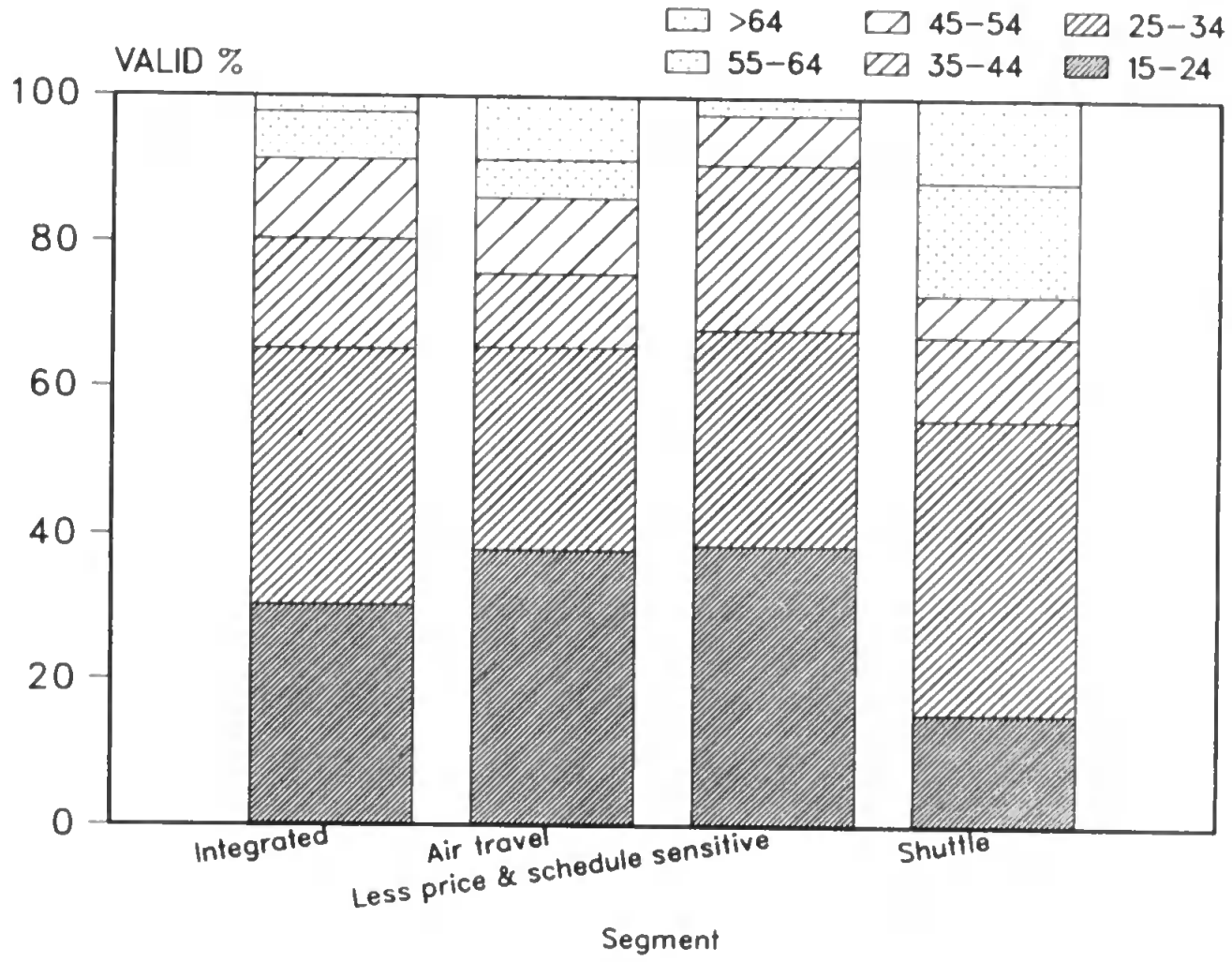
Figure 11.5: Mean scores for service attributes, non-business passengers at Belfast International airport

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Table 11.4: Principal components for non-business passengers at Belfast International airport

Principal component	service attributes loading >0.5	Components named
PC$_1$	Low price, discount fares facilities for disabled persons	Price
PC$_2$	Good food, in flight entertainment, decor	In flight facilities
PC$_3$	Check-in time required, ease of booking distance to and from origin and destination	Access/ convenience
PC$_4$	Bus and rail connections	Public transport
PC$_5$	Flight and total travel time, check in time	Travel time
PC$_6$	Time and day of departure	Schedule
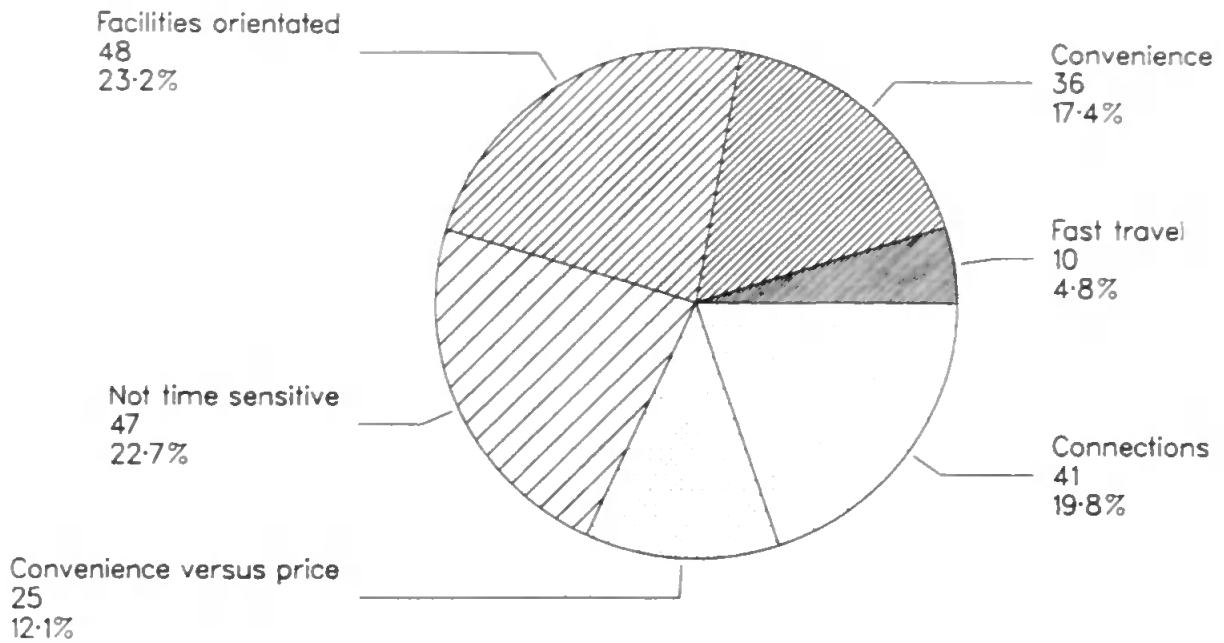
Figure 11.6: Size of benefit segments, Belfast International airport non-business passengers

11.2.2 Benefit segment construction

Clustering on factor scores produces 6 segments with 10 or more members (see figure 11.6). The mean factor scores for the segments are presented in table 11.5 and represented graphically in figure 11.7. The labelled segments, based on the pattern of mean factor scores, are presented in table 11.6.

The segments constructed among non-business passengers at Belfast International airport are dominated by the price and schedule components. Virtually every segment features one or both of these components as either among the two most important or the two least important factors. This may reflect the greater frequency of flights at this airport.

11.2.3 Profiling benefit segments

In common with non-business passengers at Belfast City airport, very few significant differences are detected between these segments using chi-squared

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Table 11.5: Mean factor scores for segments: non-business passengers at Belfast International airport. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (10)	Segment 2 (36)	Segment 3 (48)	Segment 4 (47)	Segment 5 (25)	Segment 6 (41)
Price	-2.295	-0.722	0.089	0.248	0.409	0.452
In flight facs	0.670	-1.179	0.739	0.109	0.130	-0.189
Access/conv	-0.303	0.378	0.536	-1.147	0.424	0.117
Public transp.	-0.291	0.208	0.485	-0.052	-1.871	0.503
Travel time	1.166	-0.163	0.200	-0.512	0.043	0.170
Schedule	-1.216	0.611	0.595	0.248	-0.080	-1.141

Table 11.6: Benefit segment labels: non-business passengers at Belfast International airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (10)	Travel time In flight facilities	Price Schedule	Fast travel
2 (36)	Schedule Access/convenience	In flight facilities Price	Convenience
3 (48)	In flight facilities Schedule		Facilities orientated
4 (47)	Price Schedule	Access/ convenience Travel time	Not time sensitive
5 (25)	Access/convenience Price	Connections Schedule	Convenience *versus* price
6 (41)	Connections Price	Schedule In flight facilities	Connections

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Fast travel   Convenience   Facilities orientated

Not time sensitive   Convenience versus price   Connections

1: Price   3: Access/convenience   5: Travel time
2: In-flight facilities   4: Public transport   6: Schedule
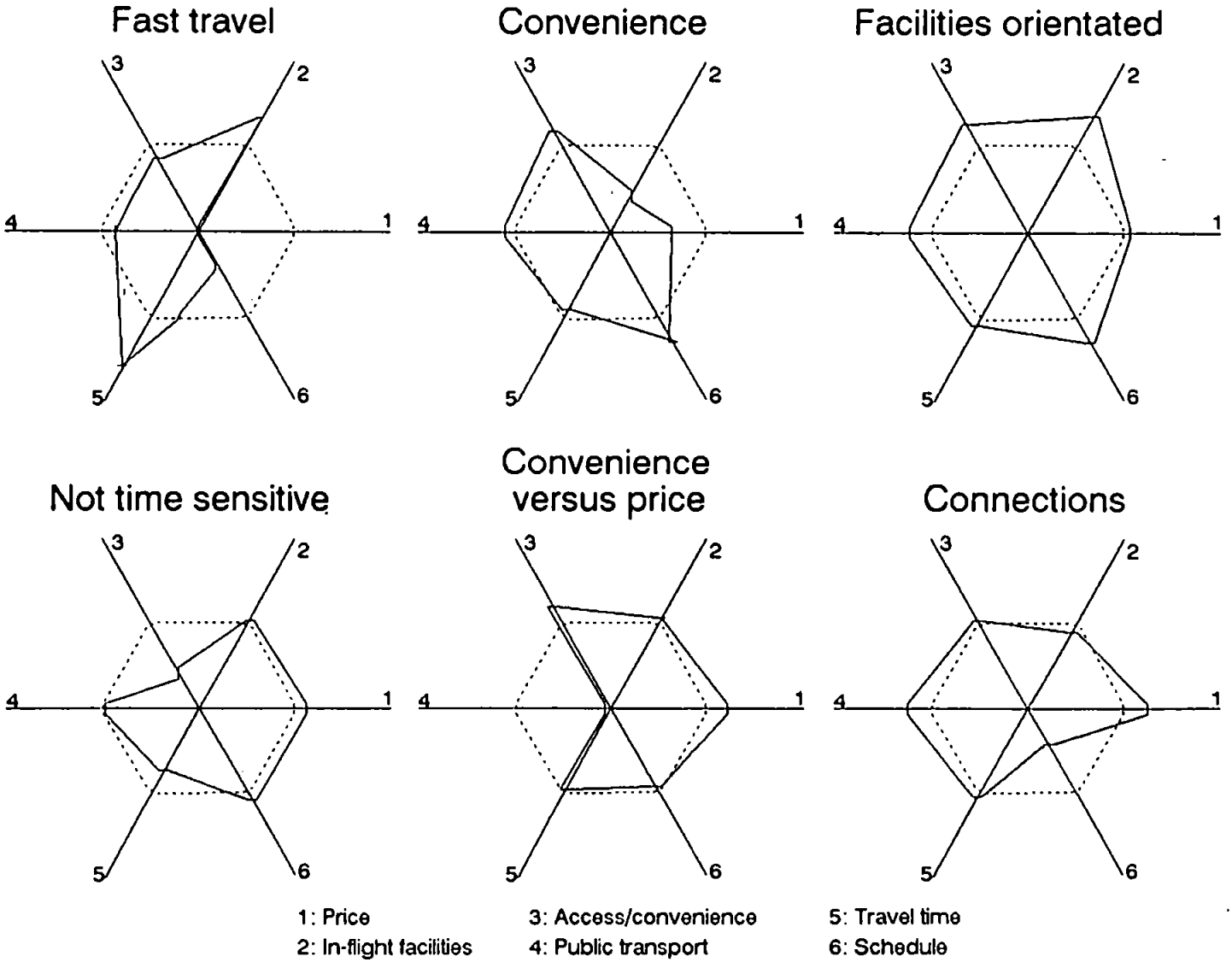
Figure 11.7: Belfast International airport non-business passengers, umbrella diagrams

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Table 11.7: Profile of the 'fast travel' segment, Belfast International airport non-business passengers

60% purchase tickets from other sources
70% are male
89% have an income less than £25,00
50% have travelled more than 5 times in the last 12 months

analysis. Areas where significant differences exist between the segments are as follows:

- Who the passenger is travelling with

- Where the tickets are purchased

- Sex

- Income

- Previous use of GB→Ireland air services

The Fast travel segment

The 'fast travel' segment (see table 11.7) is the only segment where the majority of tickets are not purchased from a travel agent. More than half of this segment purchase their ticket from somewhere other than a travel agent or at the airport. This segment is predominantly male. It tends to be a lower income segment with higher proportions of passengers than expected in all income categories up to £25,000 and fewer than expected above this level. Members of this segment appear to travel more frequently than other segments. This high frequency of travel is not consistent with the lower income profile. One suggestion is that this segment may include HMF personnel serving in Northern Ireland going on leave. These results should be treated with caution as this is a very small segment which may be less stable over time.

Table 11.8: Profile of the 'convenience' segment, Belfast International airport non-business passengers

42% did not purchase tickets from a travel agent
75% are male
72% used the service 1-5 times in the previous year
64% have an income between £10-25,000

Table 11.9: Profile of the 'facilities orientated ' segment, Belfast International airport non-business passengers

58% are female
44% have an income less than £10,000
40% have not used a GB→Ireland air service in the last 12 months

The Convenience segment

A slightly higher proportion of the 'convenience' segment (see table 11.8) also do not purchase their ticket from a travel agent. However, more members of this segment purchase their tickets at the airport. This segment is also predominantly male and has a mid-range income profile with more passengers than expected in the income categories between £10,000 and £25,000 and fewer than expected either side of this range. The 'convenience' segment contains the lowest proportion of passengers who have not used an air service between GB and Ireland in the last 12 months. The majority of this segment have used the service between one and five times in the last 12 months.

The Facilities orientated segment

The 'facilities orientated' segment is the largest segment among non-business passengers at this airport. In contrast to the previous two segments (see table 11.9), female passengers form the majority in this segment. This segment

Table 11.10: Profile of the 'not time sensitive' segment, Belfast International airport non-business passengers

64% are male
38% have an income £20-40,00
32% have not used the service in the last 12 months

Table 11.11: Profile of the 'convenience *versus* price' segment, Belfast International airport non-business passengers

52% are female
59% have an income over £25,000
48% have not used the service in the past 12 months

has the lowest income profile with the highest proportions of passengers in the two low income categories and fewer passengers than expected with an income over £15,000. It also contains a higher proportion of passengers who have not used the service in the last 12 months.

The Not time sensitive segment

The 'not time sensitive' segment (see table 11.10) also contains a predominance of male passengers. This segment has a higher income profile with more passengers than expected in the income categories £20-25,000 and £25-40,000. In common with the previous segment, this segment also contains a higher than expected proportion of passengers who have not used the service in the last 12 months.

The convenience *versus* price segment

The 'convenience *versus* price' segment (see table 11.11) has a slight majority of female passengers. This is the highest income segment with the lowest proportions of passengers in all income categories up to £20,000 and more than expected over this level and the highest proportions of passengers in

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Table 11.12: Profile of the 'connections' segment, Belfast International airport non-business passengers

71% are female
37% have an income £15-25,000
80% had used the service in past 12 months

the 2 higher income categories However, almost half of this segment have not used a GB to Ireland air service in the last 12 months.

The Connections segment

In common with the 'facilities orientated' segment, the 'connections' segment (see table 11.12) is also predominantly female. It has a middle range income profile with the highest proportions of passengers in the £15-20,000 and £20-25,000 income categories. In contrast with the 'facilities orientated' segment, this segment contains a lower proportion of passengers who have not used a GB to Ireland air service in the past 12 months.

11.3 Non-business air passengers at Dublin airport

The mean factor scores for service attributes are presented in figure 11.8.

11.3.1 Principal components

Principal components analysis produces 6 components which account for 62.2% of the variance, a slightly lower proportion than for the other two airports. The components, following rotation are presented in table 11.13. The factors developed for non-business passengers Dublin airport differ from those at the Northern Ireland airports in that a component called 'pro-
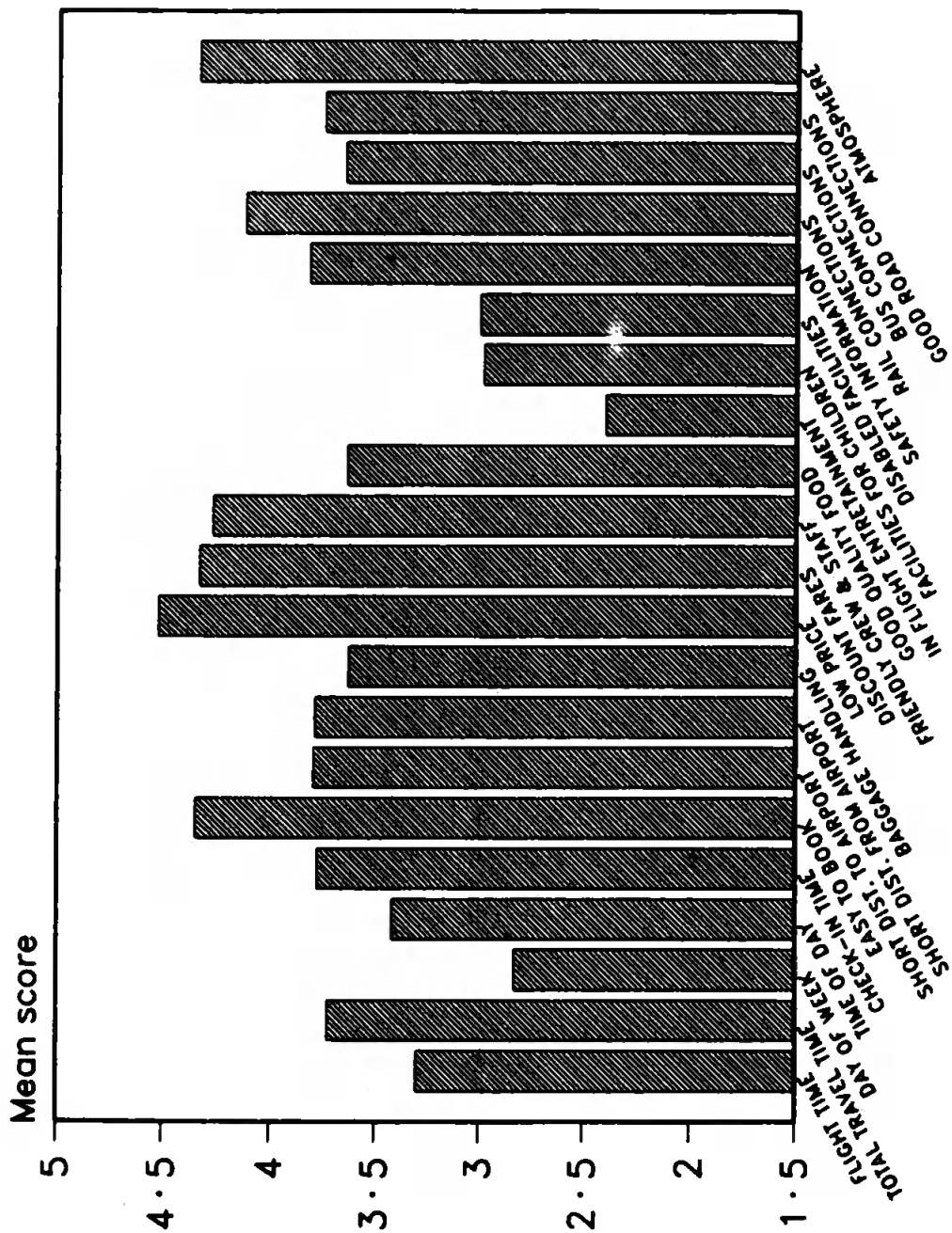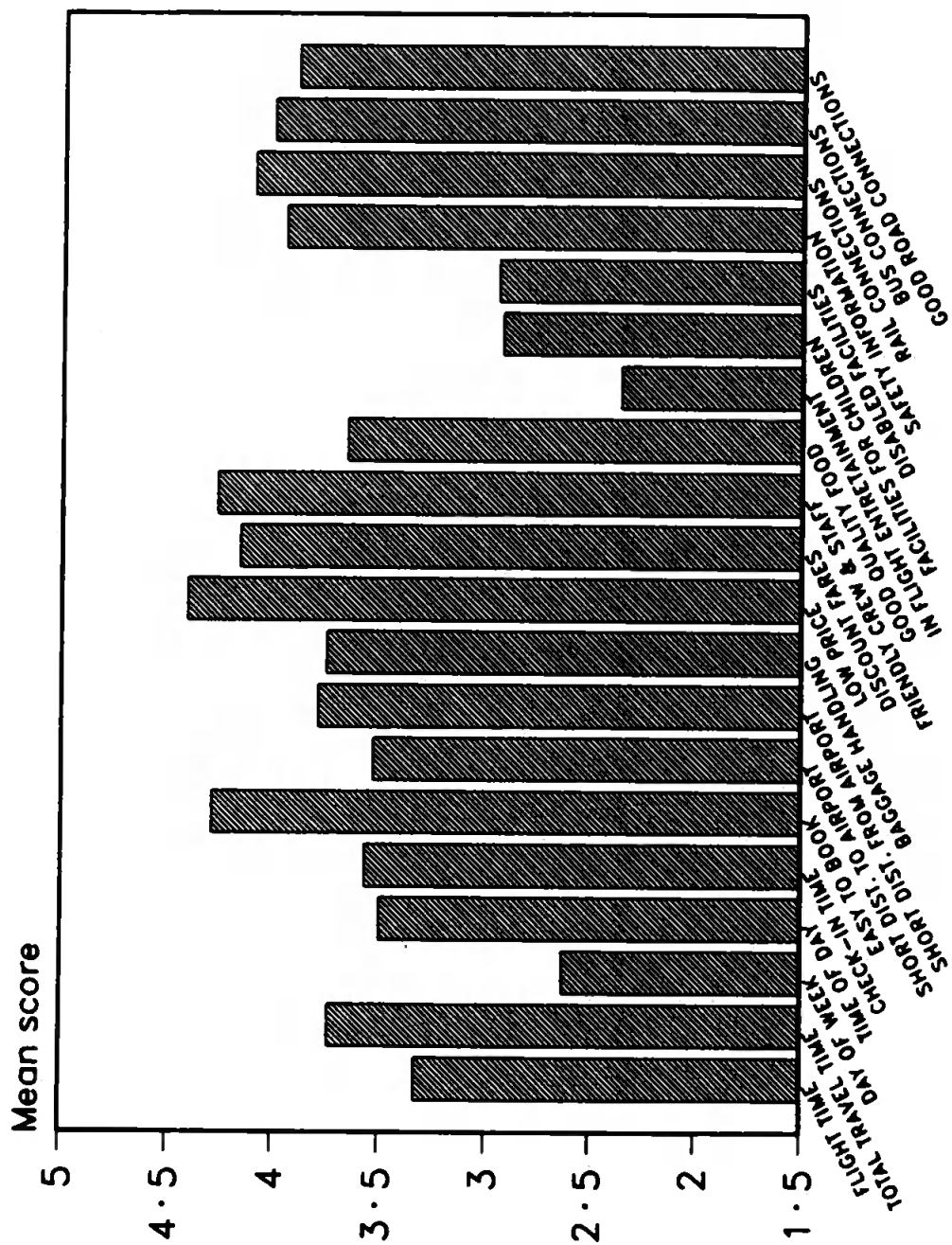
Figure 11.8: Mean scores for service attributes, non-business passengers at Dublin airport

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Table 11.13: Principal components for non-business passengers at Dublin airport

Principal component	service attributes loading >0.5	Components named
PC_1	Friendly crew and staff, good food, in flight entertainment, decor, facilities for children and disabled persons	In flight facilities
PC_2	Flight and total travel time, distance from airport	Travel time
PC_3	Ease of booking, baggage facilities, friendly attitude	Process/ ancilliary
PC_4	Rail and bus connections	Public transport
PC_5	Price and discount fares	Price
PC_6	Time and day of departure	Schedule

cess/ancilliary' is developed. The process/ancilliary component comprises the service attributes ease of booking, baggage handling and friendly attitude of crew and staff. In the extended marketing mix for services (Booms and Bitner, 1981) the first two would be included in the process element; the third may also be included here as it contributes to the overall efficiency and enjoyment of the service (smooth running) by the customer.

11.3.2 Benefit segment construction

Clustering on the factor scores results in 6 segments (see figure 11.9) with 10 or more members. The mean factors scores for the segments are presented in table 11.14 and represented graphically in figure 11.10. The segments are labelled in table 11.15.
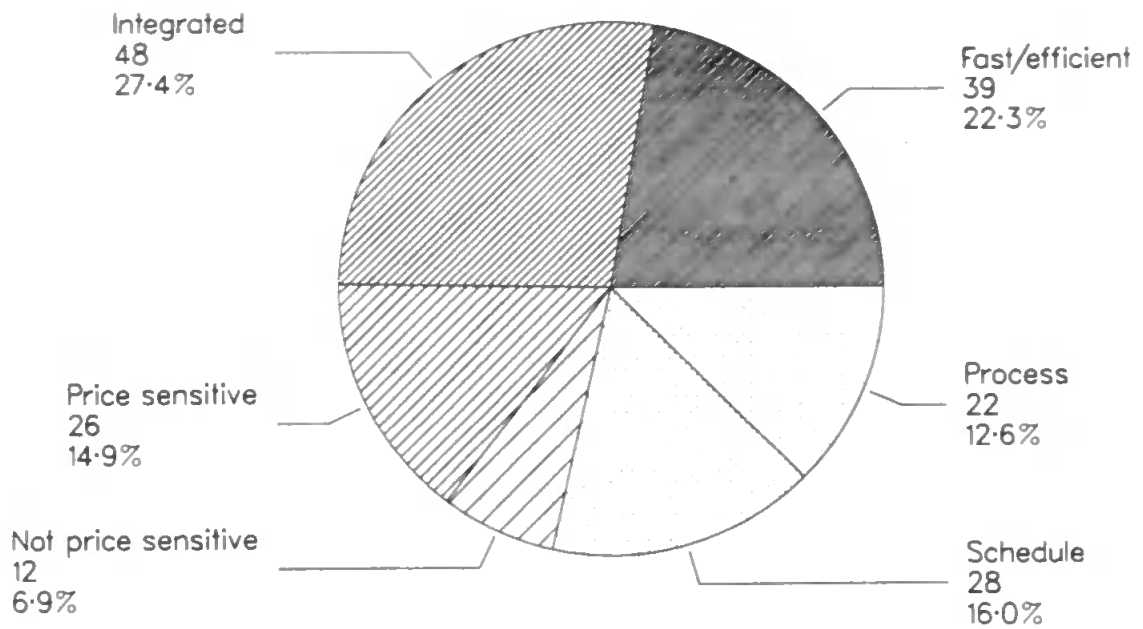
Figure 11.9: Size of benefit segments, Dublin airport non-business passengers

Table 11.14: Mean factor scores for segments: non-business passengers at Dublin airport. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (39)	Segment 2 (48)	Segment 3 (26)	Segment 4 (12)	Segment 5 (28)	Segment 6 (22)
In flight facs	0.552	-0.583	0.936	0.193	-0.890	-0.402
Travel time	0.636	0.224	-1.110	0.187	-0.462	-0.135
Process/ancill	0.567	-0.464	-0.274	-0.764	-0.275	0.936
Connections	0.348	0.603	0.088	0.094	-0.111	-1.700
Price	0.116	0.257	0.621	-2.405	-0.161	0.088
Schedule	0.488	-0.645	-0.421	-0.524	1.011	-0.445

Fast/efficient

Integrated

Price sensitive

Not price sensitive

Schedule sensitive

Process

1: In-flight facilities   3: Process/ancillary   5: Price
2: Travel time   4: Connections   6: Schedule

Figure 11.10: Dublin airport non-business passengers, umbrella diagrams

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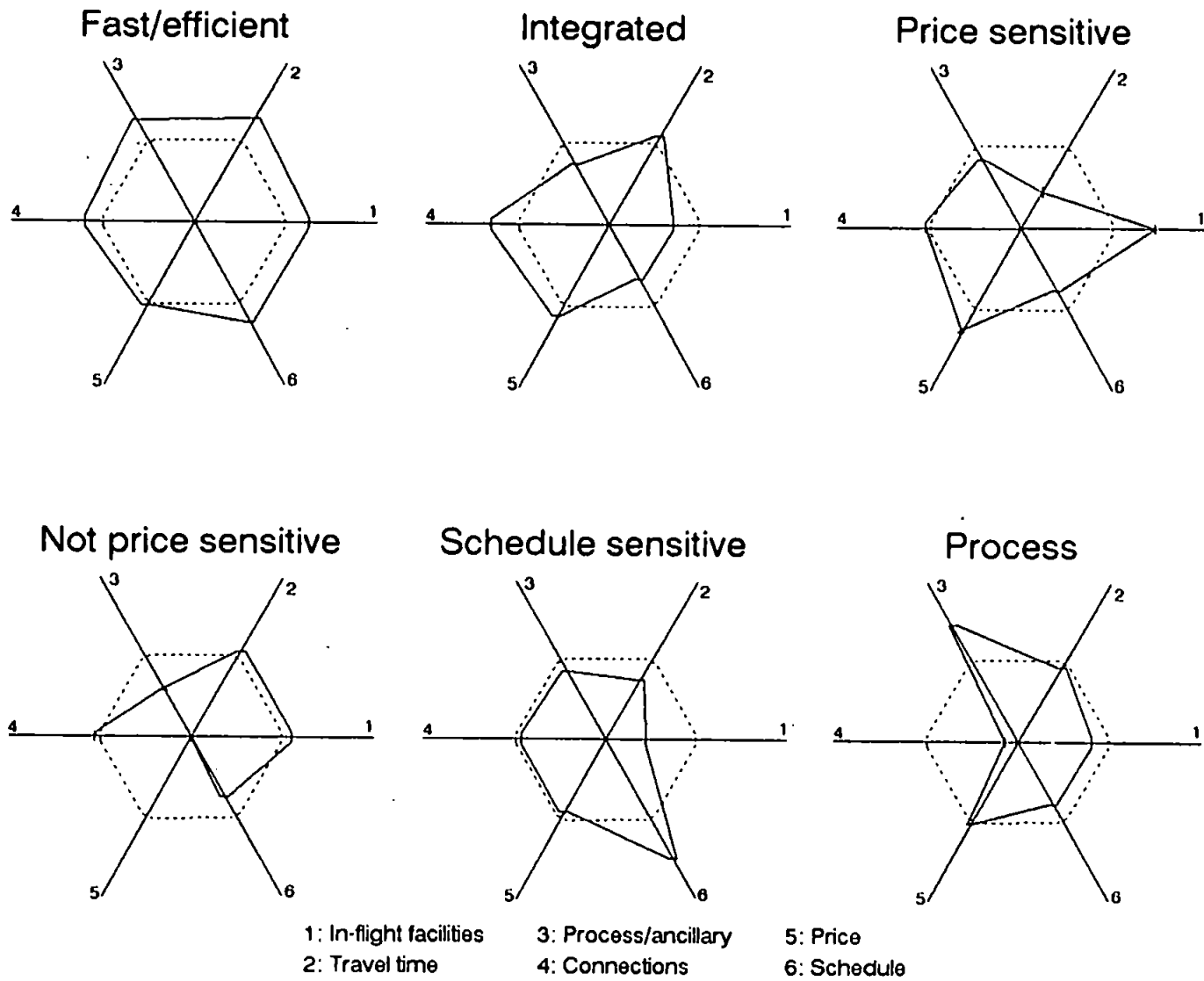
Table 11.15: Benefit segment labels: non-business passengers at Dublin airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (39)	Travel time Process/ancilliary		Fast/ efficient
2 (48)	Connections Price	Schedule In flight facilities	Integrated
3 (26)	In flight facilities Price	Travel time Schedule	Price sensitive (value for money)
4 (12)	In flight facilities Travel time	Price Process/anciliary	Not price sensitive
5 (28)	Schedule	In flight facilities Travel time	Schedule sensitive
6 (22)	Process/ancilliary Price	Connections Schedule	Process (make it easy)

The non-business passenger segments at Dublin airport are dominated by price with all except two segments featuring it as either important or not important. It should be remembered that only two surveys are conducted at Dublin airport with the result that segments constructed at this airport are small.

11.3.3 Profiling benefit segments

The only significant difference between the all benefit segments for non-business passengers at Dublin airport is marital status. The 'integrated', 'price sensitive' and 'schedule sensitive' segments contained higher proportions of single passengers with the remaining segments having a greater proportion of married passengers.

Overall it may be concluded that these segments are too small for meaningful differences to be sustained between them.

11.4 Business air passengers at Belfast City airport

Comparison of the pattern of mean scores for service attributes by business and non-business passengers at Belfast City airport suggests that the business passengers rate the time based attributes more highly and the price based aspects less highly than non-business passengers. The profile of mean scores on the service attributes for business passengers at Belfast City airport is presented in figure 11.11.

11.4.1 Principal components analysis

Principal components analysis of this data set results in 6 components which account for 64.1% of the variance. The components, following rotation are
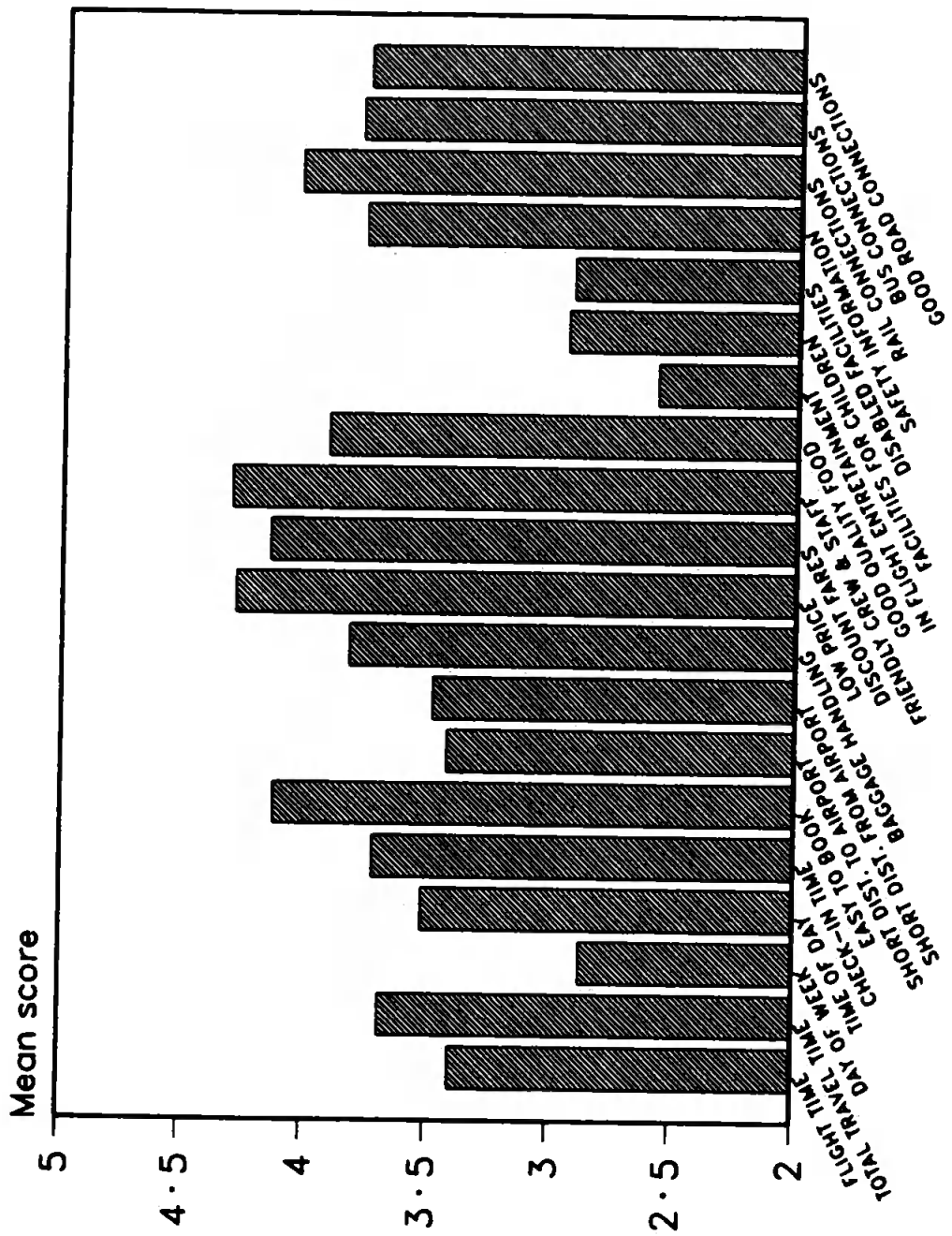
Figure 11.11: Mean scores for service attributes, business passengers at
Belfast City airport

Table 11.16: Principal components for business passengers at Belfast City airport

Principal component	service attributes loading >0.5	Components named
PC$_1$	Facilities for children and disabled persons, Public transport connections	Other facilities/ connections
PC$_2$	Friendly attitude, good food, in-flight entertainment, aircraft decor	In flight facilities
PC$_3$	Check-in time required, distance to and from origin and destination	Access time
PC$_4$	Price and discount fares	Price
PC$_5$	Flight time and total travel time	Travel time
PC$_6$	Time and day of departure	Schedule

presented in table 11.16.

11.4.2 Benefit Segment construction

Clustering on factor scores produces 6 segments (see figure 11.12) with 10 or more members. The mean factor scores for segments are presented in table 11.17 and represented graphically in figure 11.13. The segments are labelled in table 11.18.

11.4.3 Profiling benefit segments

The following variables are found to differ significantly between all segments:

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Most price sensitive
51
15·3%

In flight facilities
47
14·1%

Price/schedule sensitive
63
18·9%

Time sensitive
40
12·0%

Least price sensitive
57
17·1%

Facilities orientated
75
22·5%
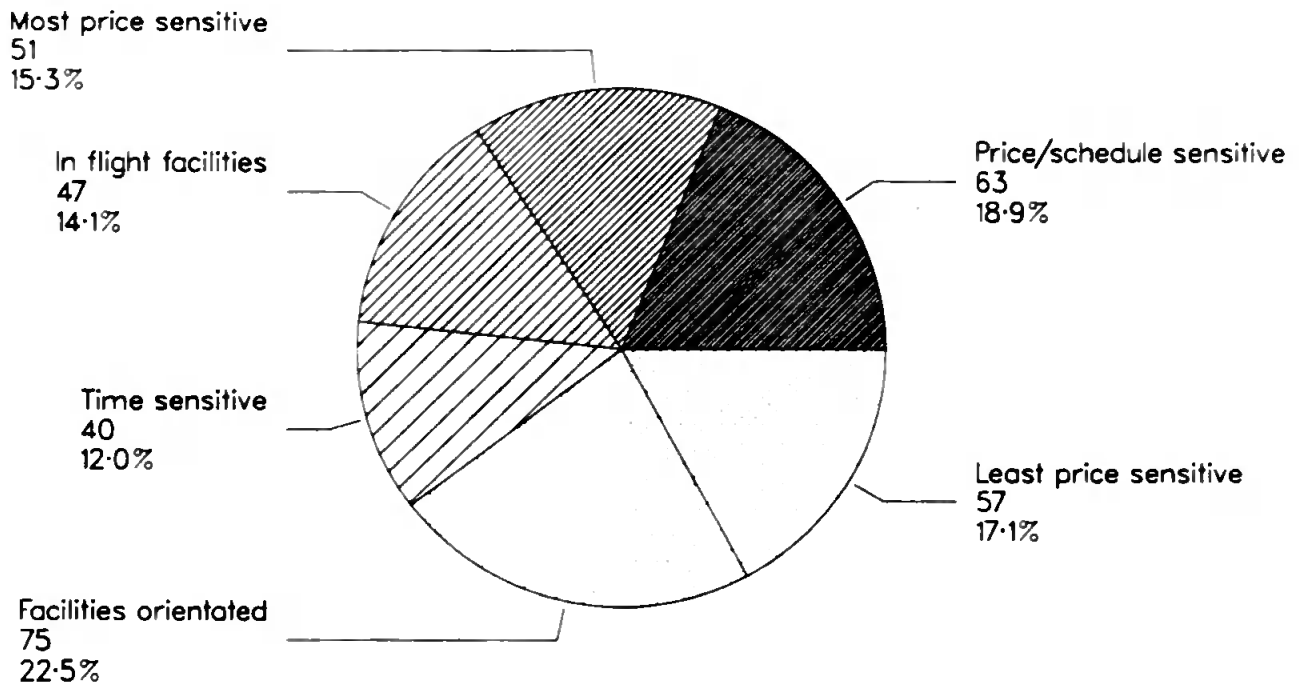
Figure 11.12: Size of benefit segments, Belfast City airport business passengers

Table 11.17: Mean factor scores for segments: business passengers at Belfast City airport. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (63)	Segment 2 (51)	Segment 3 (47)	Segment 4 (40)	Segment 5 (75)	Segment 6 (57)
Other facs/conns	0.514	0.017	-1.108	-0.589	0.843	-0.395
In flight facs	-0.398	-0.089	0.810	0.234	0.622	-1.073
Access time	0.430	-1.199	0.338	-0.685	0.311	0.234
Price	0.701	0.943	0.177	-0.645	-0.285	-0.689
Travel time	-0.614	0.202	-0.257	0.605	0.373	-0.088
Schedule	0.640	-0.466	-0.191	0.804	-0.062	-0.639

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Price/schedule
sensitive

Most price
sensitive

In flight facilities

Time sensitive

Facilities orientated

Least price
sensitive

1: Other facilities/connections   3: Access time   5: Travel time
2: In-flight facilities   4: Price   6: Schedule

Figure 11.13: Belfast City airport business passengers, umbrella diagrams

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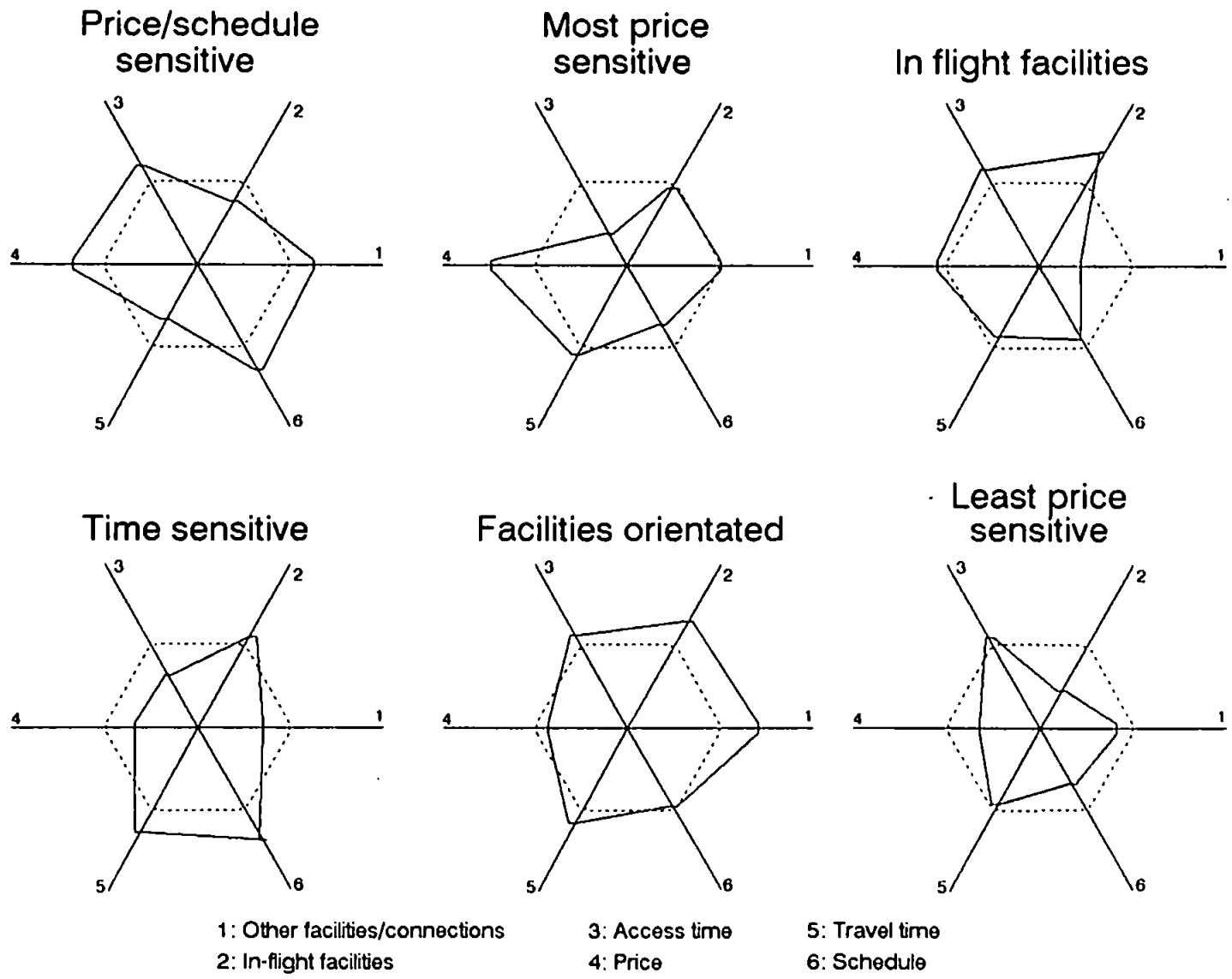
Table 11.18: Benefit segment labels: business passengers at Belfast City airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (63)	Price Schedule	Travel time Inflight facilities	Price/schedule sensitive
2 (51)	Price Travel time	Access time Schedule	Most price sensitive
3 (47)	In flight facilities Access time	Other facs/conns Travel time	In flight facilities
4 (40)	Schedule Travel time	Access time Price	Time sensitive
5 (75)	Other facs/connections In flight facilities	Price Schedule	Facilities orientated
6 (57)	Access time	In flight facs Price	Least price sensitive

Table 11.19: Profile of the 'price/schedule sensitive' segment, Belfast City airport business passengers

35% travel in June
54% travel before 2pm
29% continue their journey by taxi
48% use some form of discount
22% are female
12% have an income less than £5,000

- Season

- Means of continuing journey from the port

- Whether a discount is used

- Sex

- Income

- Time of day of departure

The Price/schedule sensitive segment

The 'price/schedule sensitive' segment (see table 11.19) contains the highest proportion of passengers who travel in June. This segment has the highest proportion of passengers who travel either before 8am or at lunchtime (12-2pm). That more passengers travel before 2pm and less after this time suggests this segment is orientated towards morning travel. It also contains the highest proportion of passengers who continue their journey from the destination airport by taxi. More passengers than expected continue their journey by all other means with the exception of their own car, suggesting that members of this segment are more likely to be resident in Northern Ireland. Almost half this segment take advantage of some form of discount. This segment contains the highest proportion of female passengers although the figure is still low, reflecting the common observation that business pas-

Table 11.20: Profile of the 'price sensitive' segment, Belfast City airport business passengers

31% travel in March
40% travel on flights departing between 8 and 10 am
35% continue the journey in their own car
33% use some form of discount
39% have an income between £10-20,000

sengers are predominantly male. With regard to income, higher proportions of passengers are found at either end of the income range than expected, with the highest proportions of passengers in the less than £5,000 and the £25-40,000 income categories.

The Price sensitive segment

The highest proportion of the 'price sensitive' segment (see table 11.20) travel in March. In common with the 'price and schedule sensitive' segment, this segment is also orientated towards morning travel. There are also more passengers than expected on early afternoon and evening flights. More members of this segment continue their journey by bus or a lift in a car than in other segments. One-third of the members of this segment take advantage of some form of discount. More passengers than expected have an income between £10,000 and £25,000 with fewer passengers than expected at either end of the income scale.

The Inflight facilities segment

The 'in-flight facilities' segment (see table 11.21) contains the highest proportion of passengers travelling in December. In contrast to the previous two segments, passengers in this segment travel on flights later in the day. The majority of passengers in this segment intend to continue their journey from the destination airport in their own car suggesting this segment is pre-

Table 11.21: Profile of the 'in-flight facilities' segment, Belfast City airport business passengers

```
43% travel in December
65% travel on flights departing after 4pm
64% continue the journey in their own car
80% do not use any discount
95% are male
32% have an income between £15-25,000
```

Table 11.22: Profile of the 'time sensitive' segment, Belfast City airport business passengers

```
38% travel in March, 35% in December
55% travel between 4 and 6 pm
60% continue the journey in their own car
93% do not use any discount
95% are male
50% have an income between £25-40,000
```

dominantly resident in GB. Less than 20% of the members of this segment use some form of discount and they are again predominantly male. This segment has a slightly higher income profile compared to the 'price sensitive' segment with the highest proportions of passengers in the £15-20,000 and £20-25,000 income categories.

The Time sensitive segment

The highest proportion of the 'time sensitive' segment (see table 11.22) travel in March. More passengers than expected are also found to have travelled in December. This segment predominantly travels between 4 and 6pm. Fewer members of this segment than expected travel at any other time of the day. In common with the 'in-flight facilities' segment, the majority of this segment continue their journey in their own car suggesting that this segment is also predominantly resident in GB. This segment has the lowest

Table 11.23: Profile of the 'facilities orientated' segment, Belfast City airport business passengers

33% travel in March
33% travel before 8am
40% continue the journey in their own car
19% are female
55% have an income over £20,000

proportion of passengers who take advantage of some form of discount and again in common with the 'in-flight facilities' segment the majority are male. With regard to income, half the members of this segment fall in the £25-40,000 category.

The Facilities orientated segment

More members of the 'facilities orientated' segment (see table 11.23) travel in March. More members of this segment than expected travelled before 8am. Fewer than expected passengers continue their journey in their own car suggesting more are normally resident in Northern Ireland. There is a higher proportion of female passengers in this segment. This 'facilities orientated' segment and the 'least price sensitive' segment have similar income profiles. Both contain higher than expected proportions of passengers in the over £40,000 and the £20-25,000 income categories. The 'facilities orientated' segment has a higher than expected proportion of passengers in the £5-10,000 category while the 'convenience' segment has a greater proportion of passengers in the £10-15,000 category.

The Least price sensitive segment

The 'least price sensitive' segment (see table 11.24) contains higher than expected proportions of passengers travelling in December and March. It was not expected that the business market would exhibit any indication

Table 11.24: Profile of the 'least price sensitive' segment, Belfast City airport business passengers

35% travel in both December and March
39% travel between 4 and 6 pm
51% continue the journey in their own car
95% are male

of seasonality, especially considering that the non-business passenger did not show any such indications. A higher proportion of this segment travel between 4 and 6pm. A slight majority of this segment continue their journey in their own car.

11.5   Business air passengers at Belfast International airport

The pattern of mean scores on the service attributes are presented in figure 11.14. In common with business passengers at Belfast City airport, the time based attributes have been rated more highly and the price based attributes less so by business passengers when compared with non-business passengers at Belfast International airport.

11.5.1   Principal components analysis

Principal components analysis produces 6 components which account for 62.0% of the variance in the data. The components, following rotation, are presented in tables 11.25. The components developed for business passengers at Belfast International airport differ only slightly from those at Belfast City airport.

Figure 11.14: Mean scores for service attributes, business passengers at Belfast International airport

Table 11.25: Principal components for business passengers at Belfast International airport

Principal component	service attributes loading >0.5	Components named
PC_1	Facilities for children and disabled persons, Safety information, Public transport connections	Other facilities/ connections
PC_2	Friendly attitude, good food in flight entertainment aircraft decor	In flight facilities
PC_3	Ease of booking distance to and from origin and destination	Access (time)
PC_4	Flight time, total travel time, check-in time	Travel time
PC_5	Price and discount fares	Price
PC_6	Time and day of departure	Schedule
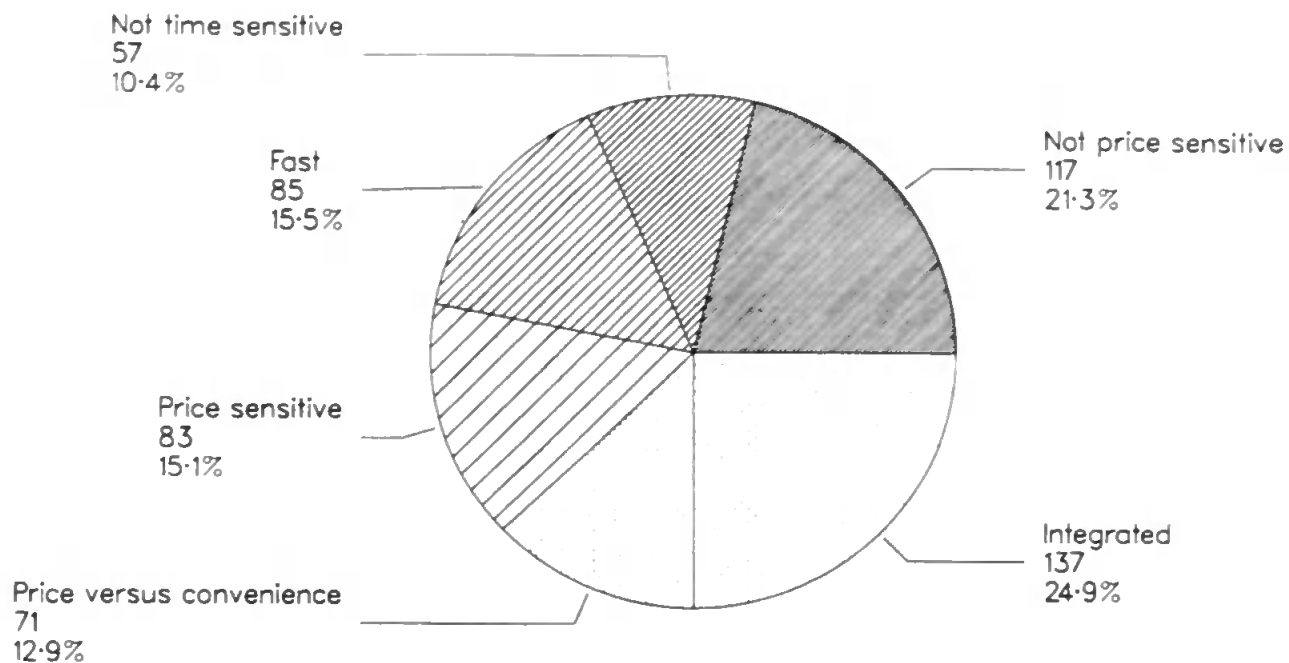
Figure 11.15: Size of benefit segments, Belfast International airport business passengers

11.5.2 Benefit segment construction

Clustering on factor scores produces 6 segments, with 10 or more members (see figure 11.15. The mean factor scores for the segments are presented in table 11.26 and represented graphically in figure 11.16. The segments are labelled in table 11.27.

11.5.3 Profiling benefit segments

The following variables are found to differ significantly between all segments:

- Departure time of flight

- Length of time spent away

- Means of arriving at the airport

- Means of continuing the journey from the airport

Table 11.26: Mean factor scores for segments: business passengers at Belfast International airport. Numbers in segments are given in brackets.

Component	Mean factor sscore					
	Segment 1 (117)	Segment 2 (57)	Segment 3 (85)	Segment 4 (83)	Segment 5 (71)	Segment 6 (137)
Other facs/conns	-0.753	-0.128	0.128	-0.865	0.293	0.859
Inflight facs	0.649	-0.649	0.158	0.683	0.484	-0.186
Access (time)	0.126	-1.192	0.077	-0.172	0.578	0.153
Travel time	0.104	-1.247	0.513	0.226	-1.107	0.534
Price	-0.747	-0.558	0.088	0.880	0.665	-0.070
Schedule	0.395	-0.366	-1.491	0.467	0.058	0.398

Table 11.27: Benefit segment labels: business passengers at Belfast International airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (117)	In flight facilities Schedule	Other facs/conns Price	Not price sensitive
2 (57)		Travel time Access (time)	Not time sensitive
3 (85)	Travel time In flight facilities	Schedule	Fast
4 (83)	Price In flight facilities	Other facs/conns Access (time)	Price sensitive
5 (71)	Price Access (time)	Travel time	Price v, convenience
6 (137)	Other facs/connections Travel time	In flight facilities Price	Integrated

Not price sensitive   Not time sensitive   Fast

Price sensitive   Price versus convenience   Integrated

1: Other facilities/connections   3: Access (time)   5: Price
2: In-flight facilities   4: Travel time   6: Schedule

Figure 11.16: Belfast International airport business passengers, umbrella diagrams

370
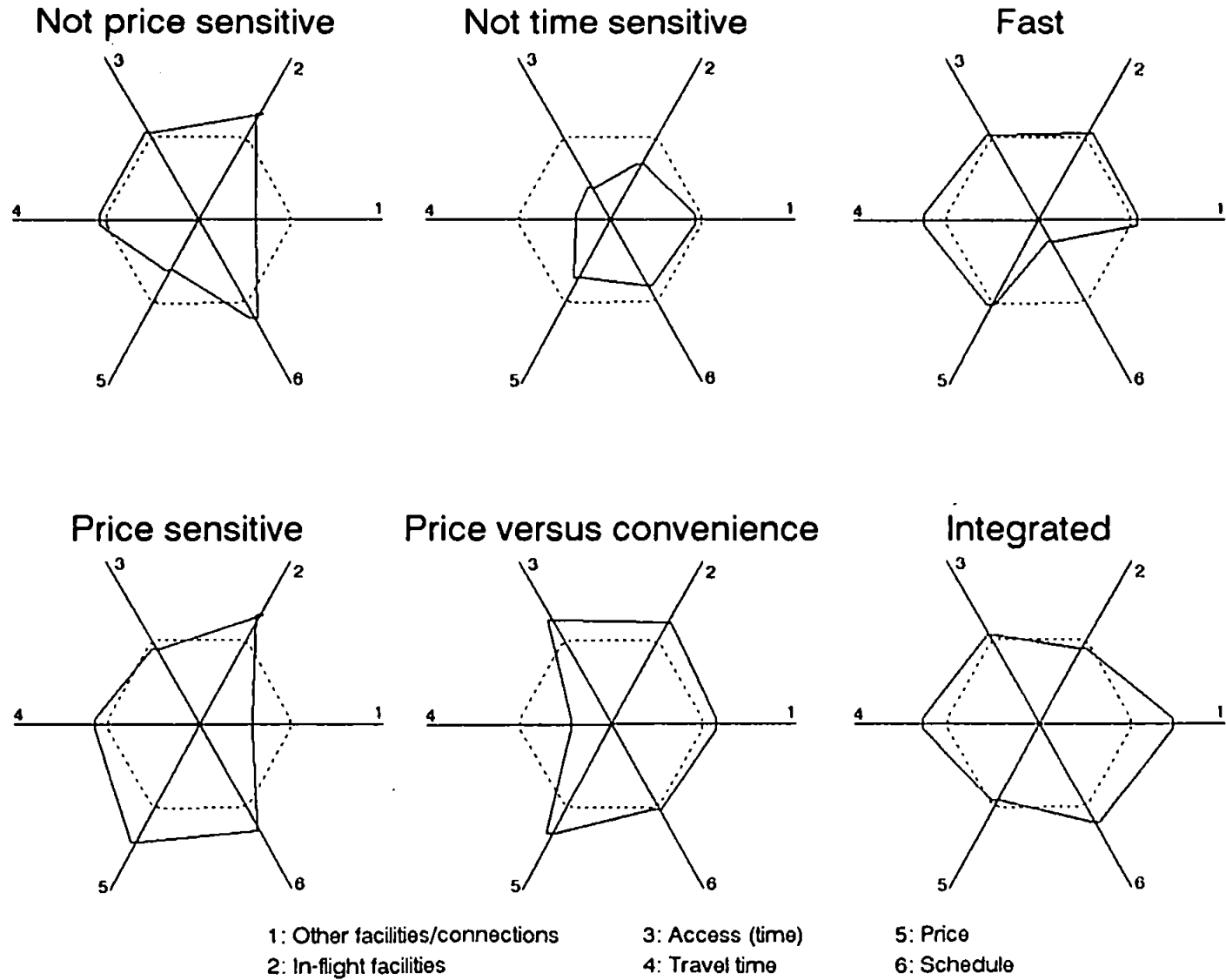
Table 11.28: Profile of the 'not price sensitive' segment, Belfast International airport business passengers

```
51% spend less than 24 hours away
22% arrive at the airport by taxi, 31% by a lift in a car
55% continue the journey in their own car
87% do not use any discount
80% have an income over £20,000
75% purchase tickets less than 1 week in advance
63% travel after 2pm
```

- Whether a discount is used

- Advance purchase time for tickets

- Income

The Not price sensitive segment

Over half of the 'not price sensitive' segment (see table 11.28) spend less than 24 hours away. This segment contains the highest proportion of passengers who arrive at the airport by taxi and more than expected also arrive in a car other than their own. The majority of passengers continue their journey in their own car, again suggesting that this segment largely lives in GB. This segment contains the lowest proportion of passengers who use a discount, this is not unexpected given the relative lack of importance attached to the price component. Another reason behind the lack of price sensitivity is the income profile of this segment, which contains fewer than expected passengers with an income less than £20,000 and more passengers with an income over £20,000. The majority of this segment purchase their tickets less than 1 week in advance. In general, more members of this segment travel in the afternoon.

The Not time sensitive segment

Table 11.29: Profile of the 'not time sensitive' segment, Belfast International airport business passengers

63% spend less than 1 week away (incl. < 24hrs)
53% travel after 12pm
32% are given a lift in a car to the airport
25% purchase tickets less than 24 hours in advance
44% have an income between £10-20,000

Table 11.30: Profile of the 'fast' segment, Belfast International airport business passengers

57% spend less than 24 hours away
59% travel before 2pm
46% arrive at the port in their own car
77% continue the journey by other means than their own car
31% purchase tickets less than 24 hours in advance

The 'not time sensitive' segment (see table 11.29) contains the highest proportion of passengers who spend less than one week away. This segment is rientated towards travel later in the day. Fewer passengers than expected travel between 4 and 6pm. The pattern of arrival at the airport is very similar to that of the 'not price sensitive' segment with less passengers using their own car and more receiving a lift in a car than expected. More members of this segments purchase tickets less than 24 hours in advance. This segment also contains the highest proportion of passengers who purchase tickets more than 3 weeks in advance. With respect to income, this segment has a low-middle range profile with more passengers than expected in the £10-20,000 range. There are also more passengers than expected in the over £40,000 income category.

The Fast segment

In common with the 'not price sensitive' segment, the 'fast' segment (see table 11.30) also contains more passengers who spend less than 24 hours

Table 11.31: Profile of the 'price sensitive' segment, Belfast International airport business passengers

```
58% spend less than 1 week away (but > 24hrs)
49% arrive at the airport in their own car
37% continue the journey in their own car
37% use some form of discount
21% purchase tickets more than 2 weeks in advance
74% have an income between £15-40,000
68% travel after 12pm
```

away. More members of this segment travel before 2pm. In contrast to the previous two segments however, more members of this 'fast' segment arrive at the airport in their own car. This coupled with a higher proportion of passengers who continue their journey by rail and taxi suggests that more members of this segment are normally resident in Northern Ireland. This segment has the shortest booking horizon among business passenger segments at Belfast International airport. The income profile of this segment is difficult to characterise. There are higher than expected proportions of passengers at either end of the income range.

The Price sensitive segment

The 'price sensitive' segment (see table 11.31) shares several aspects of travel behaviour with the 'fast' segment. The majority of the 'price sensitive' segment spend less than one week away and a high proportion arrive at the airport in their own car. More passengers than expected continue their journey in their own car which makes an evaluation of where passengers in this segment normally live difficult on this basis. The price sensitivity of the segment may be a reflection of the higher proportion of passengers who take advantage of some form of discount. The higher proportion of passengers purchasing tickets more than two weeks in advance may indicate greater price sensitivity and perhaps greater awareness of advance purchase discounts. In potential conflict with the price sensitivity charcteristic of the

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Table 11.32: Profile of the 'price *versus* convenience' segment, Belfast International airport business passengers

```
16% spend more than 2 weeks away
41% arrive at the airport in their own car
31% in another car
25% continue the journey by rail, 13% bt taxi
28% purchase tickets less than 24 hours in advance
40% have an income between £10-20,000
50% travel between 8am and 2pm
```

segment the income profile of this segment appears to be higher than for the previous two segments with the highest proportion of passengers in the £15-20,000 and more passengers than expected in the £25-40,000 income categories. With respect to flight departure time, this segment is orientated towards afternoon and evening travel.

The Price *versus* convenience segment

The 'price *versus* convenience' segment (see table 11.32) spends a longer period away than any of the segments discussed for business passengers at this airport thus far, fewer than expected spend less than 2 weeks away but a higher proportion than expected spend more than 2 weeks away. The pattern of arrival at the airport in the 'price *versus* convenience' segment is similar to that of the 'not price sensitive' and 'not time sensitive' segments, with fewer passengers than expected arriving at the airport in their own car and more receiving a lift in a car. In contrast to the 'not price sensitive' and 'not time sensitive' segments, more passengers in the 'price *versus* convenience' segment continue their journey by rail or by taxi. In common with the 'not time sensitive' and 'fast' segments, a high proportion of the 'price *versus* convenience' segment purchase tickets less than 24 hours in advance The income profile of this segment is similar to that of the 'not time sensitive' segment with more passengers than expected in the £10-20,000 income range. This segment is orientated towards morning and lunchtime travel.

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Table 11.33: Profile of the 'integrated' segment, Belfast International airport business passengers

37% spend less than 24 hours away
40% travel before 12pm
50% arrive at the airport in their own car
36% continue their journey by rail
32% use some form of discount
65% purchase tickets less than 1 week in advance (incl. $< 24hrs$)
43% have an income between £15-25,000

The Integrated segment

The 'integrated' segment (see table 11.33) contains a higher proportion of passengers than expected who spend less than 24 hours away. There is again more morning travel in this segment. This segment has the highest proportion of pasengers who arrive at the airport in their own car which may suggest that more members of this segment are normally resident in Northern Ireland. The high proportion of passengers continuing their journey by rail or given a lift in a car supports this premise. This segment also contains a higher proportion of passengers which use some form of discount, in contrast however, more passengers than expected purchase tickets less than 1 week in advance, which suggests that the discounts do not entail advance purchase of the tickets. With respect to income, the 'integrated' segment has a mid to high profile with higher proportions than expected in the £15-25,000 range.

11.6 Business air passengers at Dublin airport

The pattern of mean scores for the service attributes is presented in figure 11.17. In common with business passengers at the other two airports, more importance has been attached to the time based attributes and less to the price attributes than by non-business passengers at Dublin airport.
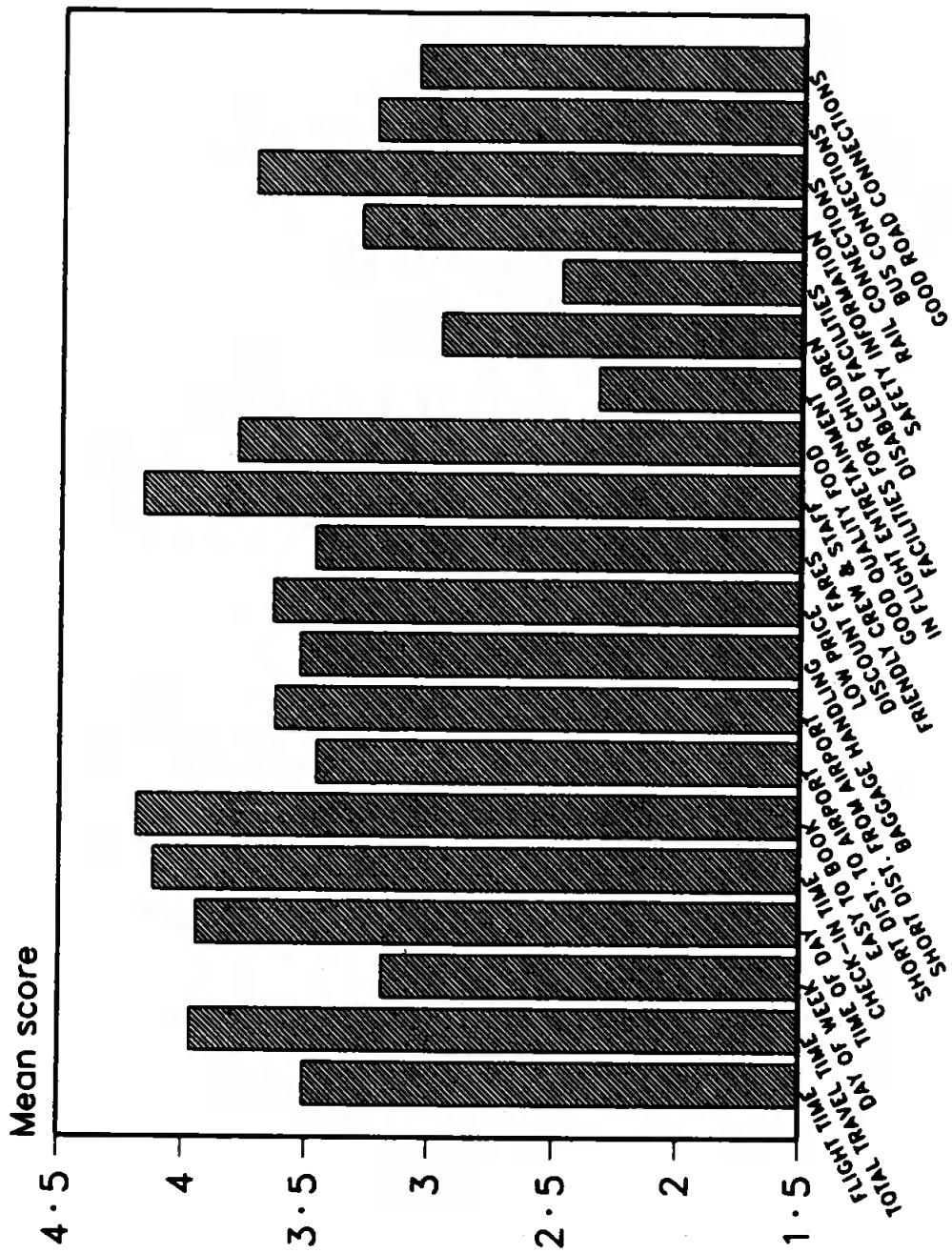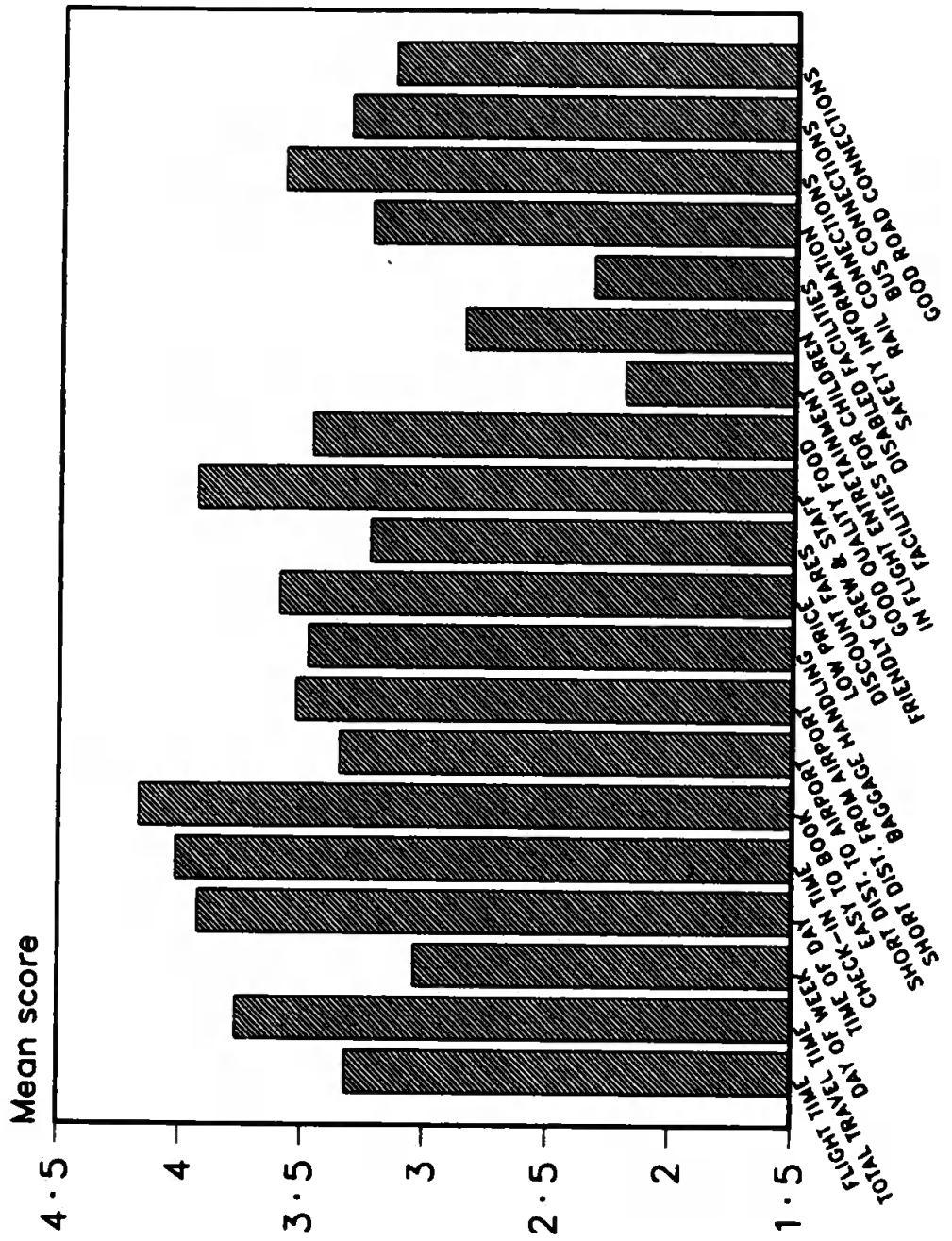
Figure 11.17: Mean scores for service attributes, business passengers at Dublin airport

Table 11.34: Principal components for business passengers at Dublin airport

Principal component	service attributes loading >0.5	Components named
PC$_1$	Facilities for children and disabled persons, Friendly attitude of crew and staff, in flight entertainment, aircraft decor, safety information	In flight facilities
PC$_2$	Low price, discount fares, rail and bus connections	Price/ connections
PC$_3$	Flight time Total travel time	Travel time
PC$_4$	Check-in time required, Easy to book, friendly attitude of crew & staff	Pre-flight treatment
PC$_5$	Distance to and from origin and destination	Access
PC$_6$	Time and day of departure	Schedule

11.6.1 Principal components analysis

Principal components analysis of business passengers at Dublin Airport produces 6 components which account for 65.4% of variance, the highest percentage among the air passenger data sets. The components, following rotation, are presented in table 11.34.

11.6.2 Benefit segment construction

Clustering on factor scores produces 6 segments with 10 or more members (see figure 11.18). The mean factor scores for segments are presented in
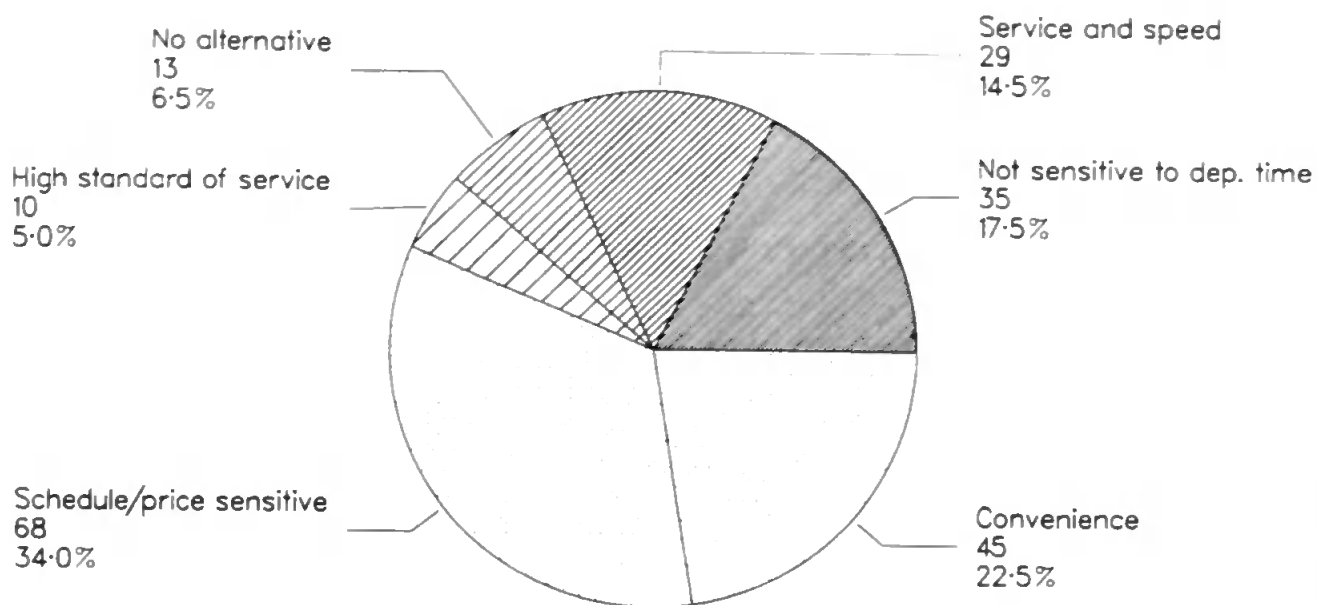
Figure 11.18: Size of benefit segments, Dublin airport business passengers

table 11.35 and represented graphically in figure 11.19. The segments are labelled in table 11.36. It should be noted that as only two surveys are carried out at this airport the resulting segments are smaller than at the other airports.

11.6.3 Profiling benefit segments

Very few differences are discovered between the business passenger benefit segments at Dublin airport, making them difficult to characterise. The only variables which differed significantly between all segments were:

- How passengers find out about the service

- Whether a discount is used

- Sex

The key differences between the segments are presented in table 11.37.

Table 11.35: Mean factor scores for segments: business passengers at Dublin airport. Numbers in segments are given in brackets.

Component	Mean factor score					
	Segment 1 (35)	Segment 2 (29)	Segment 3 (13)	Segment 4 (10)	Segment 5 (68)	Segment 6 (45)
In flight facs	0.743	-0.982	-0.673	0.919	0.228	-0.278
Price/conns	0.335	-0.018	0.175	-0.182	0.593	-1.220
Travel time	0.256	0.527	-0.209	-1.788	0.009	-0.174
Pre-flight	0.049	0.914	-2.149	0.967	0.004	-0.262
Access/route	0.501	-0.711	-0.734	-1.309	0.028	0.429
Schedule	-0.888	-0.281	-0.639	-1.081	0.711	0.239

Table 11.36: Benefit segment labels: business passengers at Dublin airport

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (35)	In flight facilities Access	Schedule	Not sensitive to departure time
2 (29)	Pre-flight treatment Travel time	In flight facilities Access/route	Service and speed
3 (13)	Price/connections	Pre-flight treatmt. Access	No alternative
4 (10)	Pre-flight treatment In flight facilities	Travel time Access	High standard of service
5 (68)	Schedule Price/connections		Schedule/price sensitive
6 (45)	Access Schedule	Price/connections In flight facilities	Convenience

Not sensitive to
departure time

Service and speed

No alternative

High standard
of service

Schedule/price
sensitive

Convenience

1: In-flight facilities   3: Travel time   5: Access/route
2: Price/connections   4: Pre-flight treatment 6: Schedule

Figure 11.19: Dublin airport business passengers, umbrella diagrams

380
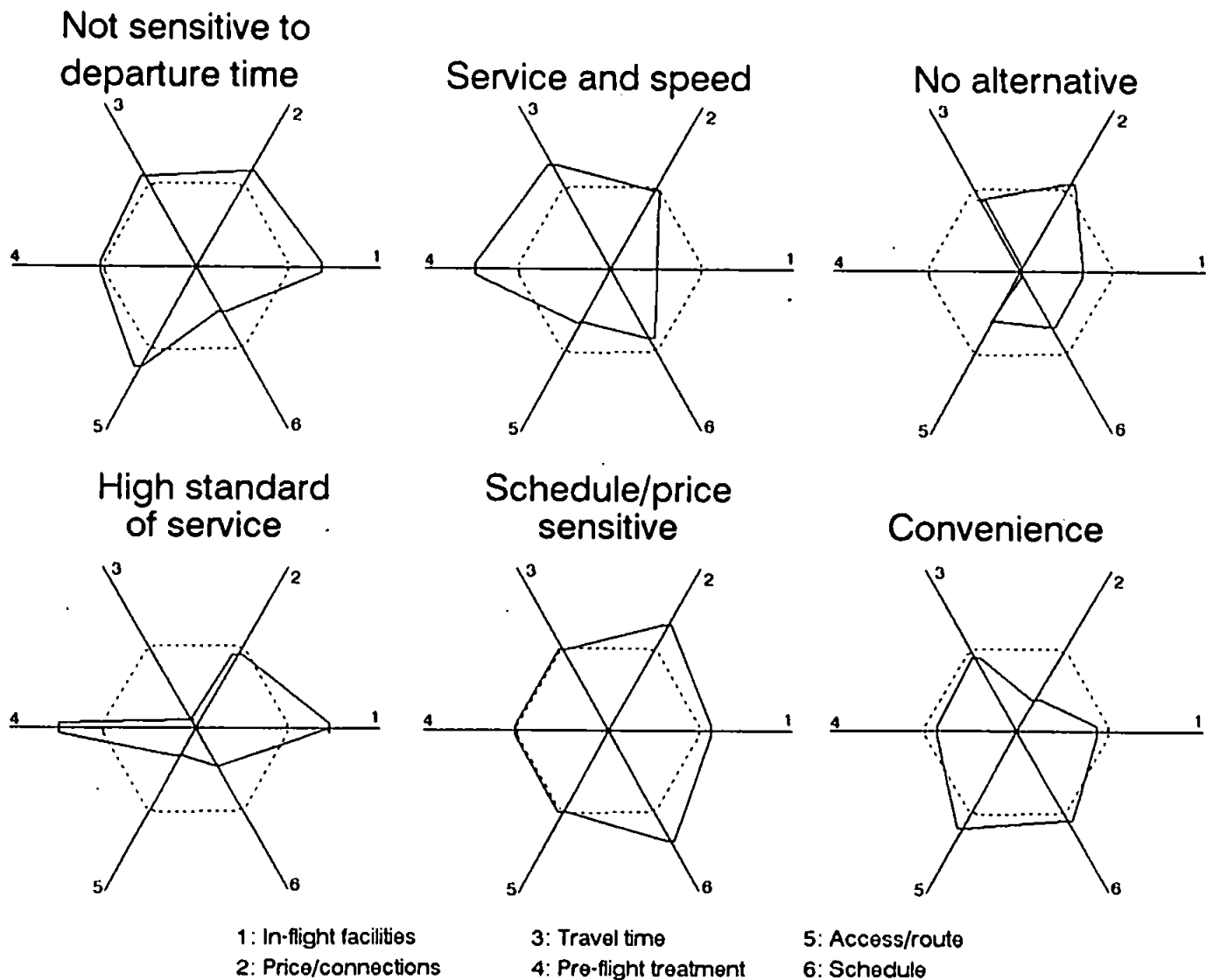
Table 11.37: Dublin airport business passengers, differences between segments

> **The not time sensitive segment**
> 64% know of the service through previous use
>
> **The service and speed segment**
> 59% know of the service through previous use
> 45% use some form of discount
>
> **The no alternative segment**
> 46% find out about the service from a travel agent
> 90% do not use a discount
> 100% are male
>
> **The high standard of service segment**
> 40% are female
> 100% do not use a discount
> 20% learn of the service through advertising
>
> **The schedule/price sensitive segment**
> 43% find out about the service from a travel agent
>
> **The convenience segment**
> 40% find out about the service from a travel agent
> 95% are male

The 'not departure time sensitive' segment contains the highest proportion of passengers who are repeat users of the service. More members of the 'service and speed' segment than expected are also repeat users. This segment also has the highest proportion of passengers who use a discount. The 'no alternative' segment has the least history of repeat use with only 38.5% having found out about the service through previous use. This segment contains the highest proportion of passengers who learn of the service through a travel agent. Over 90% of this segment do not use a discount. Although this is a small segment it is nonetheless worth mentioning that its members are exclusively male. The other small segment, 'high standard of service' in contrast, has the highest proportion of female passengers, high by business market norms. No discounts are used by this segment and more passengers find out about the service through advertising (other than newspaper or magazine) or from a recommendation. More members of the 'schedule/price sensitive' segment find out about the service from a travel agent than expected. This is also the case in the 'convenience' segment where 39.5% find out about the service from a travel agent. Again over 95% of this segment are male.

11.7   Summary

11.7.1   Principal components analysis

Principal components which are common between airports for both business and non-business passengers are also developed in the air market:

- Travel time

- Price

- Schedule

- In-flight facilities.

These components are developed for both business and non-business passengers in the air market at all airports.

A public transport connections component is developed at all airports among non-business passengers and an access component is developed for business passengers at all airports and also for non-business passengers at Belfast City airport and Belfast International airport. The only data set without an access component is non-business passengers at Dublin airport and a process/ancillary component is developed here. This is the only difference between the airports in components developed for non-business passengers.

Comparison of service choice components for sea and air passengers

Similar combinations of factors govern service choice for sea and air ferry passengers. It appears that there is a common core of components influencing service choice for both air and sea passengers:

- Travel time

- Price (not foot)

- Schedule

- on board/in-flight facilities.

Travel time, price and schedule have been previously recognised to be important in service choice (Robinson and Wind, 1978; Shaw, 1982; Bruning et al, 1982; Farris and Harding, 1976, Good et al, 1985; Morden, 1985).

Perhaps more indication of why passengers choose a sea as opposed to an air service and *vice versa* may be gained from examining the components which differ between the air and sea markets. In general, there appears to be little difference between the components important in service choice for air and sea passengers with the exception of minority and majority group

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(car passengers only) facilities which have a role in service choice for ferry passengers. It is assumed that these components include attributes of the service, for example, facilities for children, which prompt a passenger to choose a sea rather than an air service.

11.7.2   Benefit segment construction

No common segments are found to exist between airports for either business or non-business pasengers.

Uncommitted ferry or air passengers

Comparison of benefit segments developed in the air passenger market may help to identify segments which may be uncommitted to either sea or air modes of transport. From the air market, non-business passengers are more likely to switch to ferry travel and in the sea passenger market, foot passengers may have greater potential to switch to air as they are not travelling with a car.

Ferry passengers that are more likely to switch to air include:

- those requiring a fast service (travel time important)

- those travelling alone (lower fare differential?)

- those travelling for business.

The major reason for foot passengers not switching to air is probably cost and income. The perception of cost may also be important with the air service being perceived as more important than it actually is. For foot passengers the cost of the total journey is likely to be more important than be cost of the ferry or air service alone. The low cost service aspect is important to all foot passengers, although it does not emerge as a principal components. However, preliminary analysis of the data suggests that a

significant proportion of foot passengers are younger, student discounts are widely used at certain times. The young age profile may be a contributory factor in the low income profile for foot passengers. If it is the young foot passengers which have the low incomes, these passengers are more likely to switch to air should their income increase.

One common development in the construction of benefit segments for all passenger data sets is the existence of a segment which has positive mean factor scores on all the factors. These are largely termed 'facilities orientated' or 'integrated' segments. As these segments exist for both air and sea passengers it appears that both air and sea services are able to meet the needs of these passengers. Conversely, as they are mostly facilities orientated factors, and it was suggested that these facilities provide some of the stimulus in the division between choice of sea rather than an air service.

The implications for the ferry operator are to be aware of the service aspects which are important to certain groups which another service (air) might be better placed to cater for, for example, fast travel time.

11.7.3   Profiling benefit segments

Profiling benefit segments in the air market is more difficult than in the fery passenger market as fewer significant differences are found to exist between benefit segments. Only three profiling variables are employed in profiling business passengers at Dublin airport. The lower profiling ability at Dublin may be due to the smaller sample size. There are no profiling variables which are common between airports.

It is difficult to profile non-business passenger benefit segments at all airports. Belfast International is the only airport where more than one profiling variable differs significantly between segments.

A combination of benefit and *a priori* segmentations may be required in the non-business market. At Belfast City airport *a priori* segmentation may

be more useful than benefit segmentation as only four benefit segments are developed. At Belfast International airport benefit segmentation is superior and at Dublin airport neither *a priori* or benefit segmentation is particularly helpful.

Chapter 12

Benefit segment construction and profiling in the freight market

The construction of benefit segments in the freight market follows the same methodology as in the passenger markets. It should be remembered that the number of cases in the freight market is much smaller than the passengers market. This chapter will consider the construction and profiling of benefit segments for freight shippers in section 12.1, followed by freight agents or carriers in sections 12.2. and 12.3.

It is recognised that freight agents might purchase both sea and air freight services between GB and Ireland and that different criteria might exist for the purchase of sea and air services. Therefore, agents who purchase both sea and air freight services are asked to complete two rating questions, one for sea services and the other for air services. The same list of service attributes is used for both questions with the phrasing changed as appropriate. Almost all the repondents answered the sea service rating question and about 25 respondents answered the air rating question.

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12.1 Freight shippers

The first stage in the analysis is again to plot the mean scores for each of the attributes of the service (see figure 12.1). Visual appraisal of this figure suggests the three more important service attributes, those with a higher mean score, are 'on-time collection and delivery', 'avoidance of loss or damage etc', and 'fast response to any problems'. The three routing aspects, 'knowing which port is used', 'proximity of the port/airport to the origin of the goods' and 'port/airport proximity to the destination of the goods' appear to be less important.

12.1.1 Principal components analysis

Principal components analysis of the service aspects produces 5 components which explain 65.5% of the variance. All the attributes are used in the components. The factor matrice is again rotated with a varimax rotation. The components are presented in table 12.1.

12.1.2 Benefit segment construction

Owing to the smaller number of cases the partitionning cluster algorithm was only requested to produce four clusters, instead of the six clusters requested for the passenger markets. This results in three useable segments (see figure 12.2) with a respondent who has consistantly given a score of 1 to each service aspect being identified and excluded from further analysis. The mean factor scores for the segments are presented in table 12.2 and plotted in the umbrella diagrams in figure 12.3. The mean factor scores again provide the basis for naming benefit segments (see table 12.3). The emergence of a 'route sensitive' segment is unexpected given the low mean scores achieved by all the route attributes of the service. However, it should also be noted that price and the involvement of other parties are also important to this
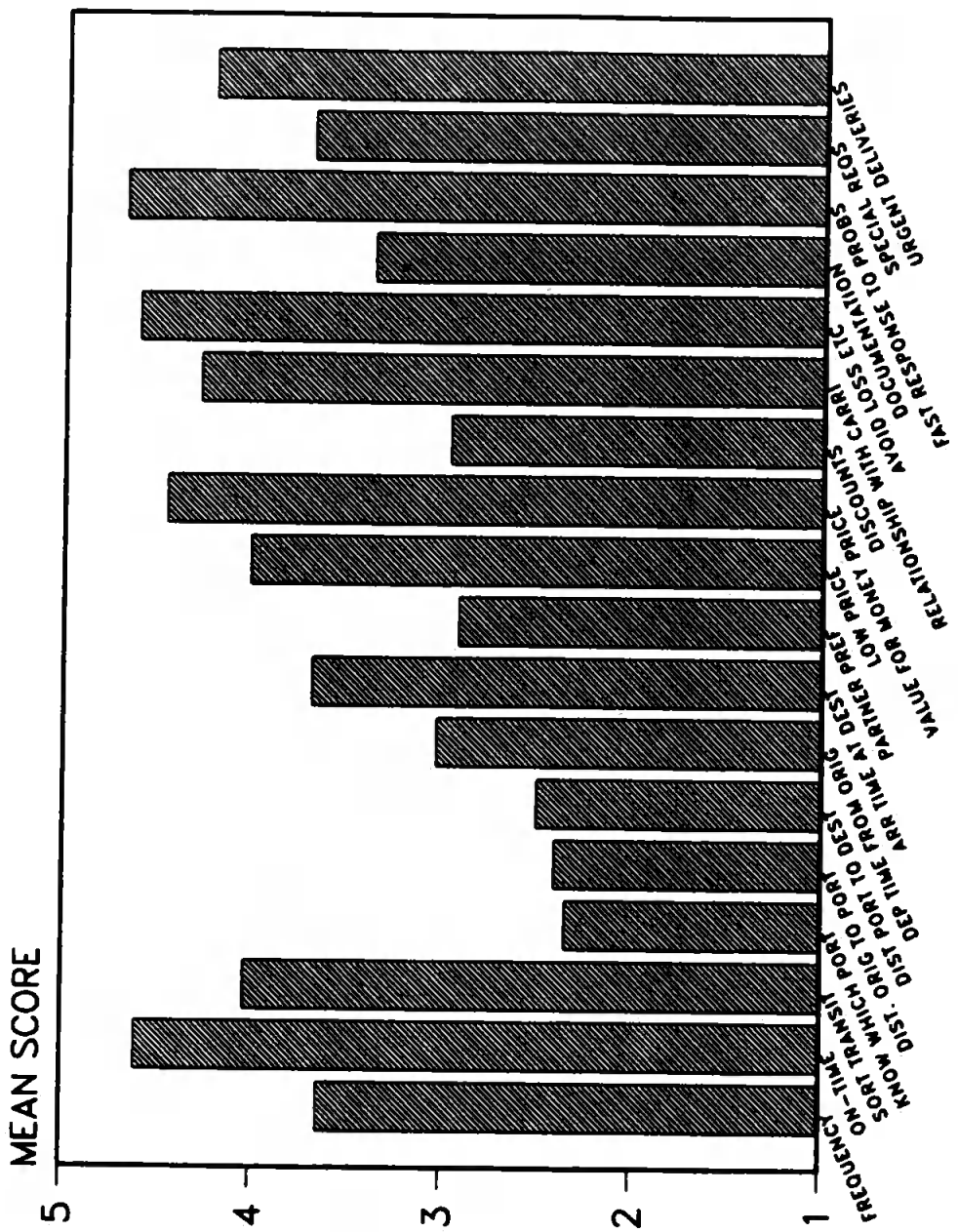
Figure 12.1: Mean scores for service attributes, freight shippers

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Table 12.1: Principal components for freight shippers

Principal component	Service attributes loading >0.5	Components named
PC_1	Arrival time Good relationship with carrier Avoidance of loss, damage, etc Fast response to any problems Able to handle special requirements Perform urgent deliveries	Carrier characteristics
PC_2	Know which port is used Proximity port to origin Proximity port to destination	Route characteristics
PC_3	High frequency of service On time collection & delivery Short transit time Departure time from origin	Timing characteristics
PC_4	Low price Value for money price Special offers or discounts	Price characteristics
PC_5	Transport preference of trading partner Documentation completed by carrier	Control over involvement of other parties
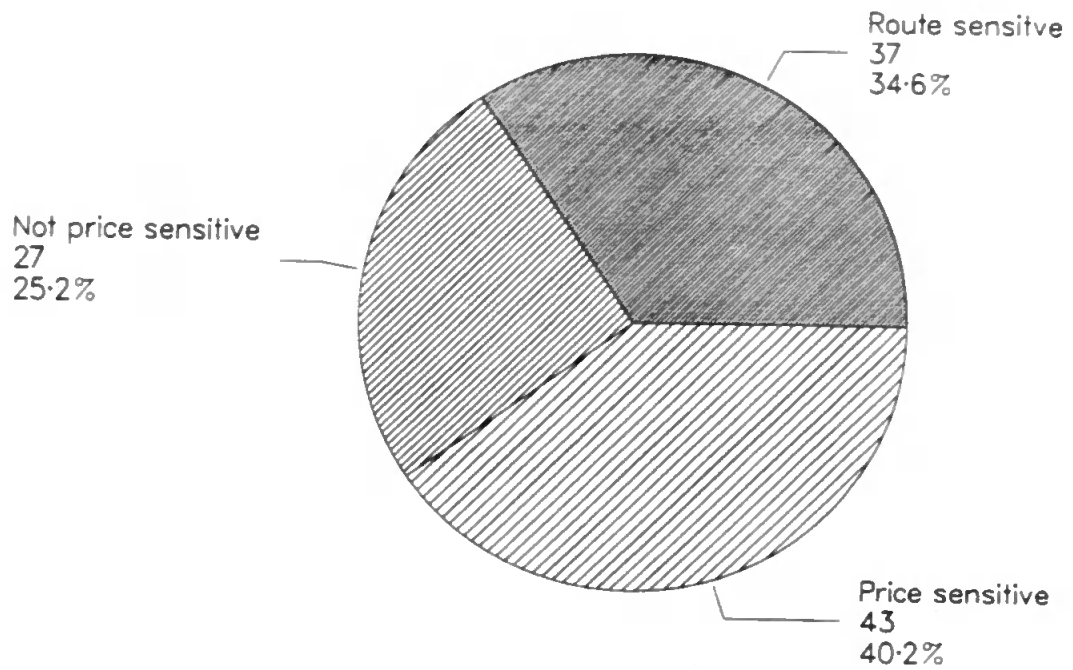
Figure 12.2: Size of benefit segments, freight shippers segment.

12.1.3 Profiling benefit segments

Crosstabulations to produce the chi-squared statistic are again used to explore areas of difference between the segments in terms of independent, or descriptor variables. Initially crosstabulations are performed between all segments but only a few areas of difference are discovered. However, the fact that only three segments are developed allows more detailed comparison to be made between the pairs of segments.

Differences between all segments

The variables which differ significantly between all the segments are all concerned with the westbound movement of goods:

- Whether consignments from GB to Ireland require special care,

Table 12.2: Mean factor scores for segments: freight shippers. Numbers in segments are given in brackets.

Component	Mean factor score		
	Segment 1 (37)	Segment 3 (27)	Segment 4 (43)
Carrier characteristics	-0.046	0.501	-0.172
Route characteristics	0.923	0.216	-0.928
Time characteristics	0.287	-0.371	-0.033
Price characteristics	0.435	-1.107	0.430
Control	0.432	-0.546	-0.091

Table 12.3: Benefit segment labels: freight shipers

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (37)	Route characteristics Price and control		Route sensitive
3 (27)	Carrier characteristics	Price Control	Not price sensitive
4 (43)	Price	Route characteristics	Price sensitive

Route sensitive   Not price sensitive   Price sensitive

1: Carrier characteristics   4: Price characteristics
2: Route characteristics   5: Involvement of
3: Timing characteristics   other parties
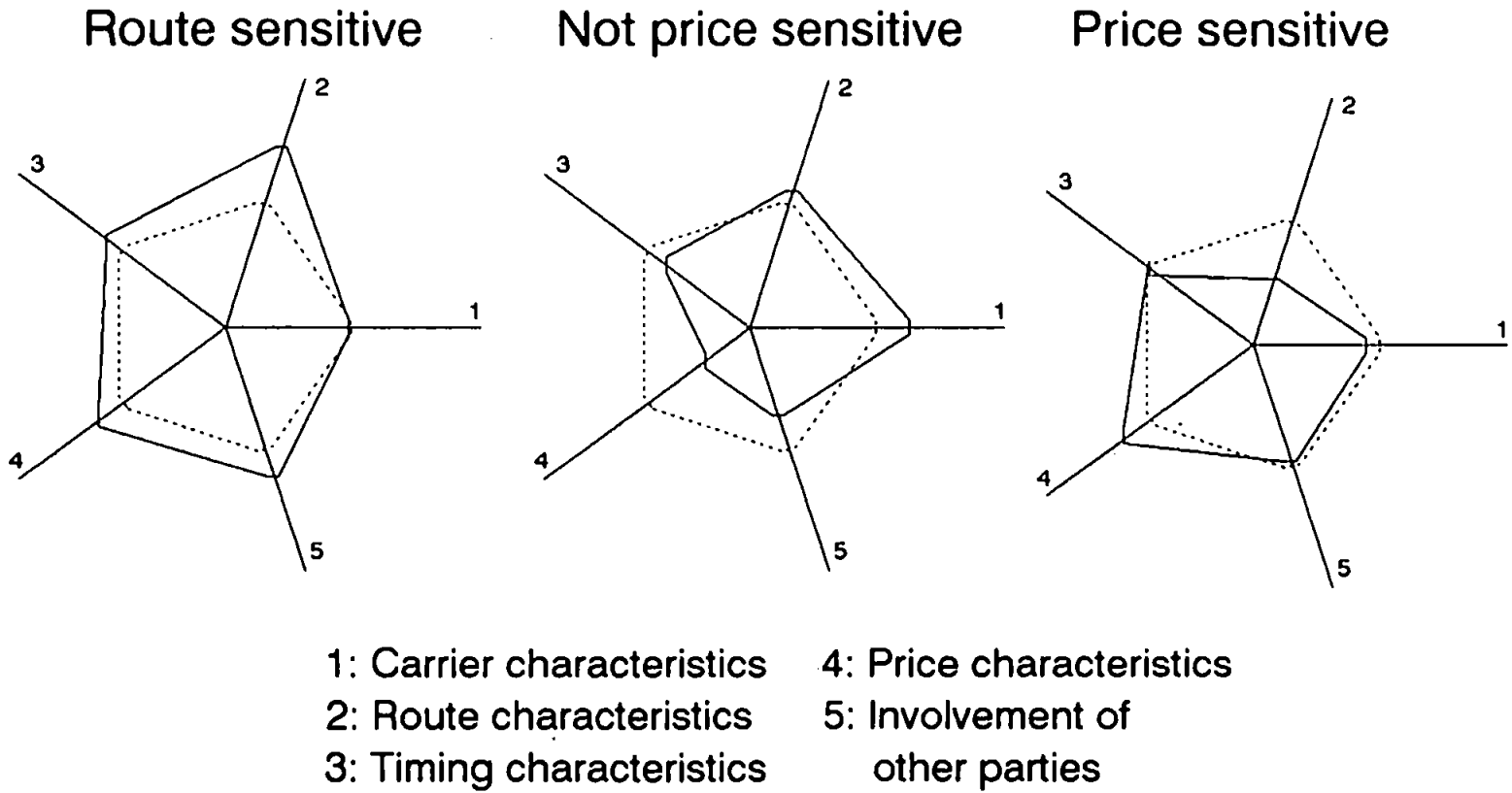
Table 12.4: Differences between freight shipper segments

Profiling variable	Segment		
	Route sensitive	Not price sensitive	Price sensitive
Require care (WB)	26.5%	39.1%	12.2%
Require monitoring	42.4%	60.9%	19.0%
GB to Ireland air service			
daily	–	27.3%	–
2-4 times/week	4.3%	–	4.0%
weekly	4.3%	36.4%	12.0%
monthly	21.7%	–	20.0%
less than monthly	56.5%	27.3%	52.0%
never	13.0%	9.1%	12.0%

- Whether consignments from GB to Ireland require special monitoring for on time delivery,

- The frequency with which companies use a GB to Ireland air service.

The differences are summarised in table 12.4. From this table it appears that for westbound consigments a higher proportion of the companies in the 'not price sensitive' segment have products which require some sort of special care and/or monitoring for on-time delivery. A higher proportion of the 'not price sensitive' segment use air services more frequently than companies in either of the other two segments.

Differences between the route sensitive and the not price sensitive segments

Only 2 variables:

- Frequency of use of a GB to Ireland air service, and

- Who pays for the GB to Ireland sea service

Table 12.5: Payment for GB to Ireland sea services, freight shippers

Who pays for for the service	Segment	
	Route sensitive	Not price sensitive
Company	25.7%	60.9%
Trading partner	45.7%	30.4%
Other party	2.9%	4.3%
Both company and trading partner	22.9%	4.3%

differ significantly betwen these two segments. The frequency of use of a GB to Ireland air service is discussed above. It should be noted that payment for GB to Ireland sea services differs at the 0.06 confidence level. Differences between the segments with respect to payment are presented in table 12.5. The fact that a majority of the 'not price sensitive' segment pay for the service may be reflected in the lack of importance which this segment attaches to the control or involvement from other parties component.

Differences between the route sensitive and the price sensitive segments

The variables which differ significantly between these 2 segments are as follows:

- Which sampling frame the company comes from

- The proportion of the company's Irish sea trade from Ireland to GB

- Whether monitoring is required for westbound consignments

- Use of a full road trailer and sea from Ireland to GB

- The managerial level of another person involved in the freight purchase decision

Table 12.6: Differences between the route sensitive and the price sensitive segments, freight shippers

Profiling Variable	Segment	
	Route sensitive	Price sensitive
Sampling frame		
NITD	56.8%	34.9%
TRPL report	43.2%	65.1%
Eastbound percentage		
less than 1010-50%	16.2%	20.9%
51-90%	24.3%	9.3%
over 90%	21.6%	7.0%
Use full road trailer and sea service		
Use	35.1%	19.0%
Do not use	57.6%	81.0%
Level of other person involved		
Director/executive	30%	–
Managerial	45%	65%
Supervisor	20%	15%
Other	5%	20%

These differences, with the exception of the need for monitoring which has already been examined, are presented in table 12.6.

Although which part of the sampling frame a company came from is unlikely to be significant *per se*, it does serve as a *quasi* variable for the location of the company. Companies taken from the NITD report are located in Northern Ireland while those from the TRPL report are based in GB and trading with companies in the Republic of Ireland. Therefore it appears that a higher proportion companies in the 'route sensitive' segment are located in Northern Ireland and a higher proportion of companies in the 'price sensitive' segment are located in GB. This premise is supported by the percentage of a companies GB/Ireland trade which moves from Ireland to GB. More companies in the 'route sensitive' segment move over half their GB/Ireland

traffic in an eastbound direction, while the majority of the price sensitive segment move less than 10% of their GB/Ireland traffic in this direction. It might be expected that companies based in Ireland would have a higher proportion of eastbound traffic. With regard to the transport options used, a higher proportion of the 'route sensitive' segment use a full road trailer in conjunction with a sea service. The number of other persons involved in the freight purchase decision is the same in both segments although this represents a higher proportion in the 'route sensitive' segment. The managerial level of other persons involved in the decision appears to be higher for the 'route sensitive' segment with 30% of those involved claiming to be at a directorial or executive level.

Differences between the not price sensitive and the price sensitive segments

Rather more differences are discovered between these two segments and more importantly in areas which have not previously appeared to differ between segments, namely the products involved and the size of the companies in terms of number of employees. The full list of variables which differ significantly between clusters is as follows:

- Westbound product

- Eastbound product (sig=0.09)

- Whether westbound products require special care

- Whether eastbound products require special care

- Whether westbound products require special monitoring

- The frequency of use of GB to Ireland air services

- The number of employees at that location (sig=0.0754)

- The total number of employees

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Table 12.7: Product differences between the not price sensitive and the price sensitive segments, freight shippers

Product group	GB to Ireland		Ireland to GB	
	Not price sensitive	Price sensitive	Not price sensitive	Price sensitive
Textiles	9.5%	28.2%	–	27.8%
Clothing	–	2.6%	9.5%	11.1%
Food & drink	9.5%	2.6%	14.3%	11.1%
Engineering	14.3%	30.8%	19.0%	11.1%
Gen. Manuf.(unfin.)	61.9%	20.5%	14.3%	–
Gen manuf (finished)	4.8%	5.1%	14.3%	–
Packaging/rejects	–	10.3%	9.5%	22.2%

Table 12.8: Other differences between the not price sensitive and the price sensitive segments, freight shippers

Variable	Not price sensitive	Price sensitive
Whether eastbound care required		
Yes	47.6%	14.3%
Number employees at this location		
less than 50	21.7%	22.5%
51-100	8.7%	30.0%
101-200	21.7%	30.0%
201-500	34.8%	15.0%
more than 500	13.0%	2.5%
Total number of employees		
less than 50	5.0%	15.4%
51-100	20.0%	26.9%
101-200	5.0%	23.1%
201-500	20.0%	23.1%
more than 500	50.0%	11.5%
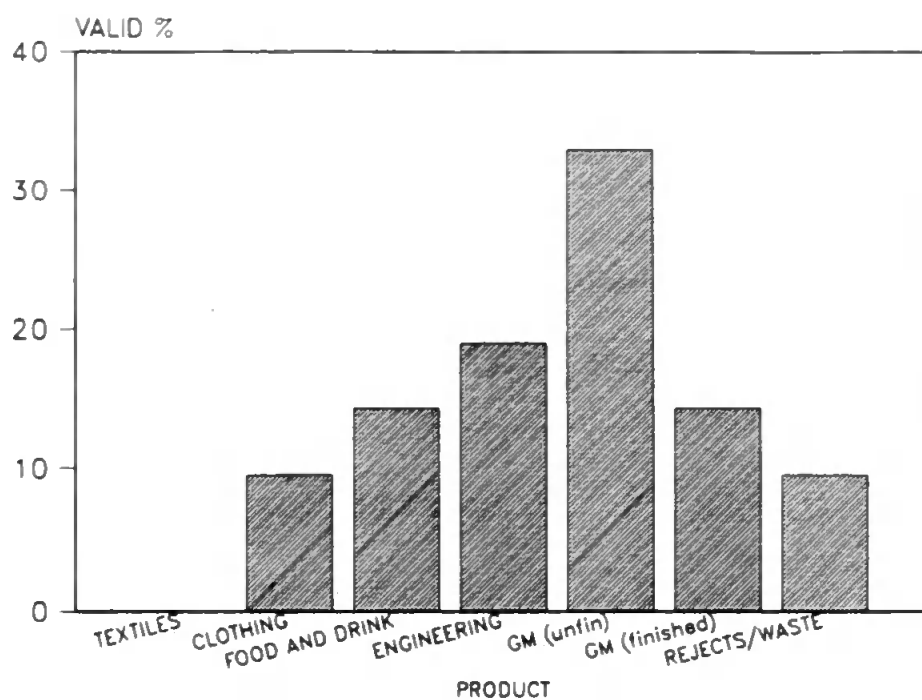
Figure 12.4: Eastbound movement of goods for the not price sensitive segment

The differences in the products between the 'not price sensitive' segment and the 'price sensitive' segment are presented in table 12.7 and other differences in table 12.8. Westbound trade in the 'not price sensitive' segment is dominated by products which fall into the category of unfinished general manufacturing goods. This dominance is much reduced in the eastbound movement of goods (see figure 12.4). Textiles and engineering products are the main westbound products for the 'price sensitive' segment. Textiles remain the largest category for the eastbound movement but rejects/waste also account for a significant proportion of the eastbound trade for this segment (see figure 12.5).

The need for special care and monitoring of westbound products has been noted previously but this is the first time that special care requirements for eastbound products has emerged. Special care for eastbound products appears to follow the same pattern as for westbound goods with a higher proportion of companies in the 'not price sensitive' segment requiring special care for their products. The number of employees of companies in each of

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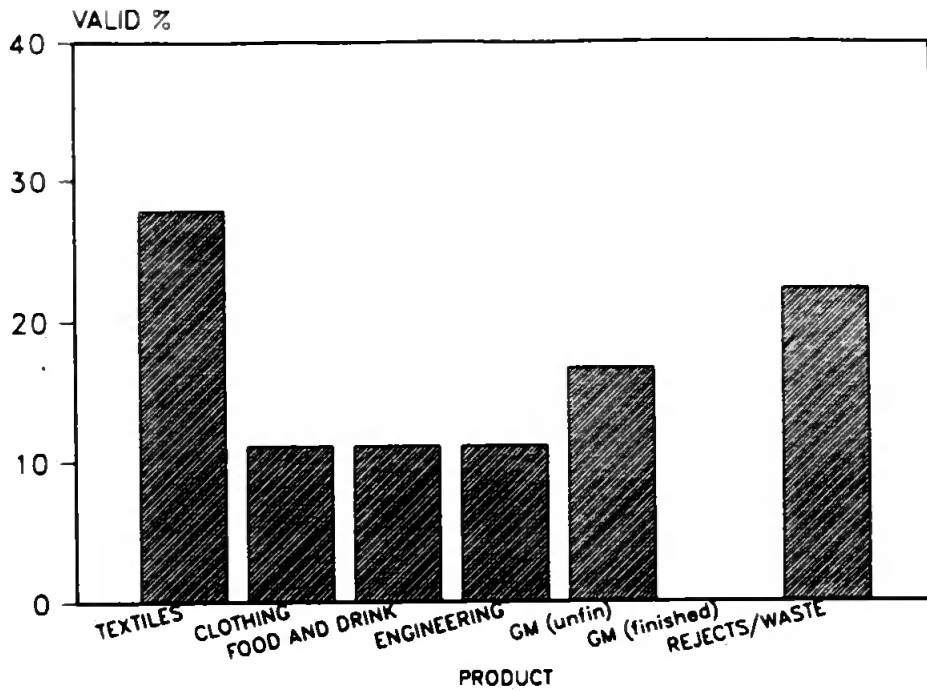
Figure 12.5: Eastbound movement of goods for the price sensitive segment, freight shippers

the segments suggests that a higher proportion of larger companies belong to the 'not price sensitive' segment.

12.2 Freight agents purchasing sea transport services

The profile of mean scores for the service attributes is presented in figure 12.6. From this figure it appears that the most important attributes of a sea service are a 'high frequency of service', 'punctuality' and the 'availability of freight space'. The 'preference of the shipper' and the 'proximitry of the port(s)' to the origin and destination of the goods appear to be less important.
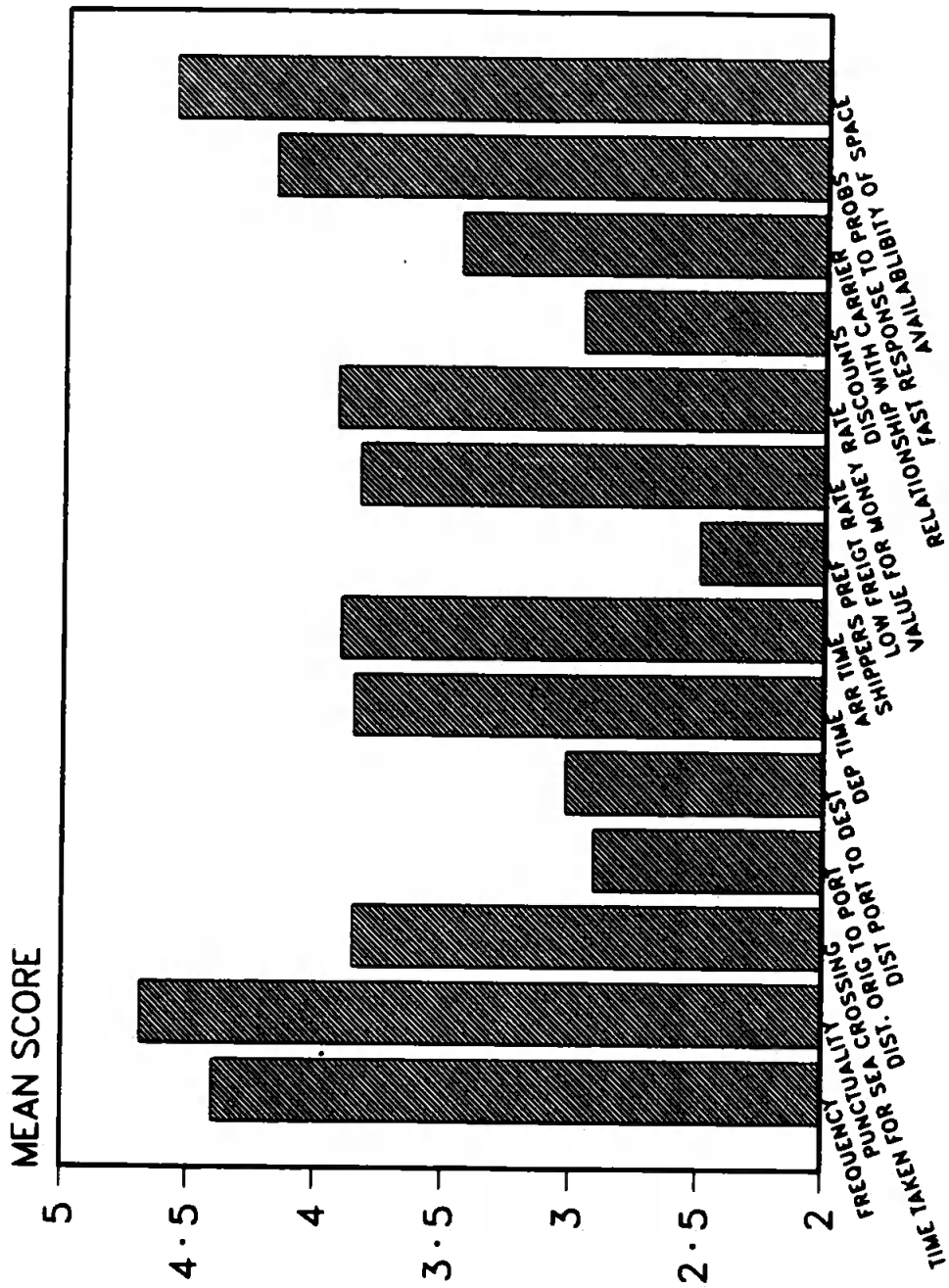
Figure 12.6: Mean score for service attributes, freight agents sea service

Table 12.9: Principal components for freight agents purchasing sea services

Principal component	Service attributes loading >0.5	Components named
PC$_1$	Departure time Arrival time Relationship with carrier	Timing/carrier
PC$_2$	High frequency of service Punctuality Fast response to problems Availability of freight space	Customer service characteristics
PC$_3$	Short sea crossing Proximitry origin to port Proximitry port to destination Shippers preference	Routing characteristics (distance)
PC$_4$	Low freight rate Value for money freight rate Special offers/discounts	Price characteristics

12.2.1 Principal components analysis

Principal components analysis produces four components which explain 68.2% of the variance. The components, following variamax rotation, are presented in table 12.9.

12.2.2 Benefit segment construction

The clustering algorithm is asked to produce four clusters. This results in three useful segments (see figure 12.7). The mean factor scores for the segments are presented in table 12.10. This table, in conjunction with the umbrella diagrams (figure 12.8), serves as the basis for labelling the segments in table 12.11.

Distance versus price
18
36·7%

Customer service
10
20·4%

Timing/carrier orientated
21
42·9%
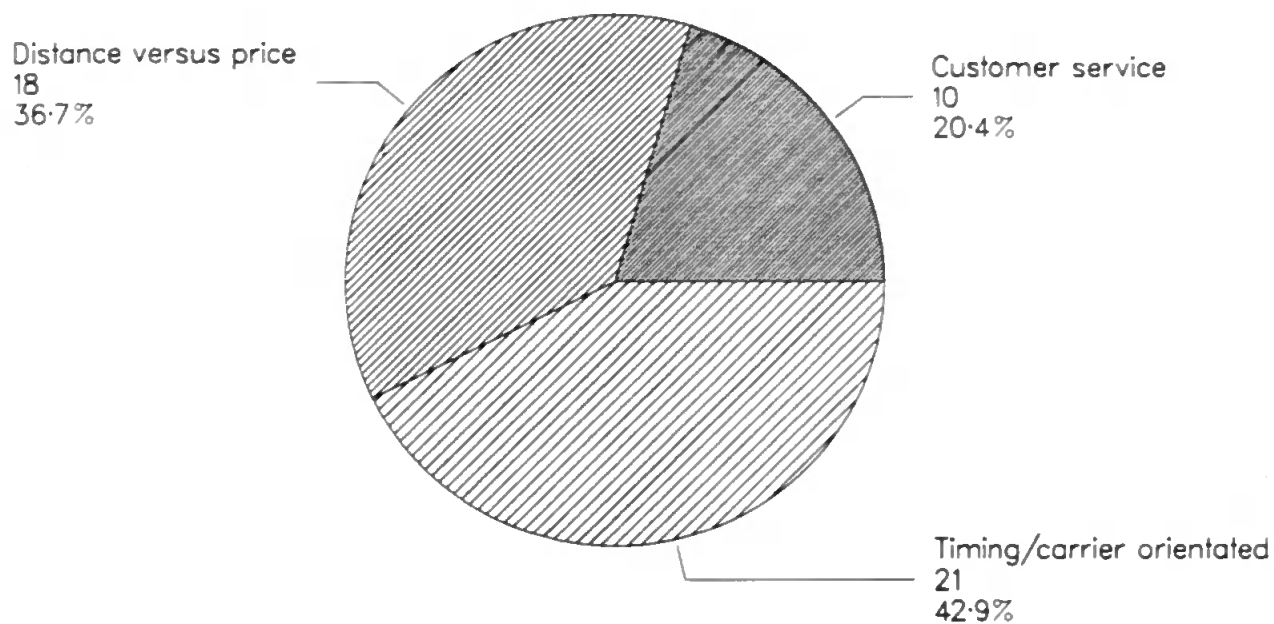
Figure 12.7: Size of benefit segments, freight agents purchasing sea services

Table 12.10: Mean factor scores for segments: freight agents purchasing sea services. Numbers in segments are given in brackets.

Component	Mean factor score		
	Segment 1 (10)	Segment 2 (18)	Segment 3 (21)
Timing/carrier	-1.327	0.078	0.572
Customer service	0.721	-0.043	-0.125
Route (distance)	-0.480	0.726	-0.631
Price	0.003	0.718	-0.513

Figure 12.8: Freight agent purchasing sea services, umbrella diagrams

Customer service   **Route versus price**   **Timing/carrier orientated**

1: Timing/carrier characteristics   3: Routing characteristics
2: Customer service characteristics   4: Price characteristics
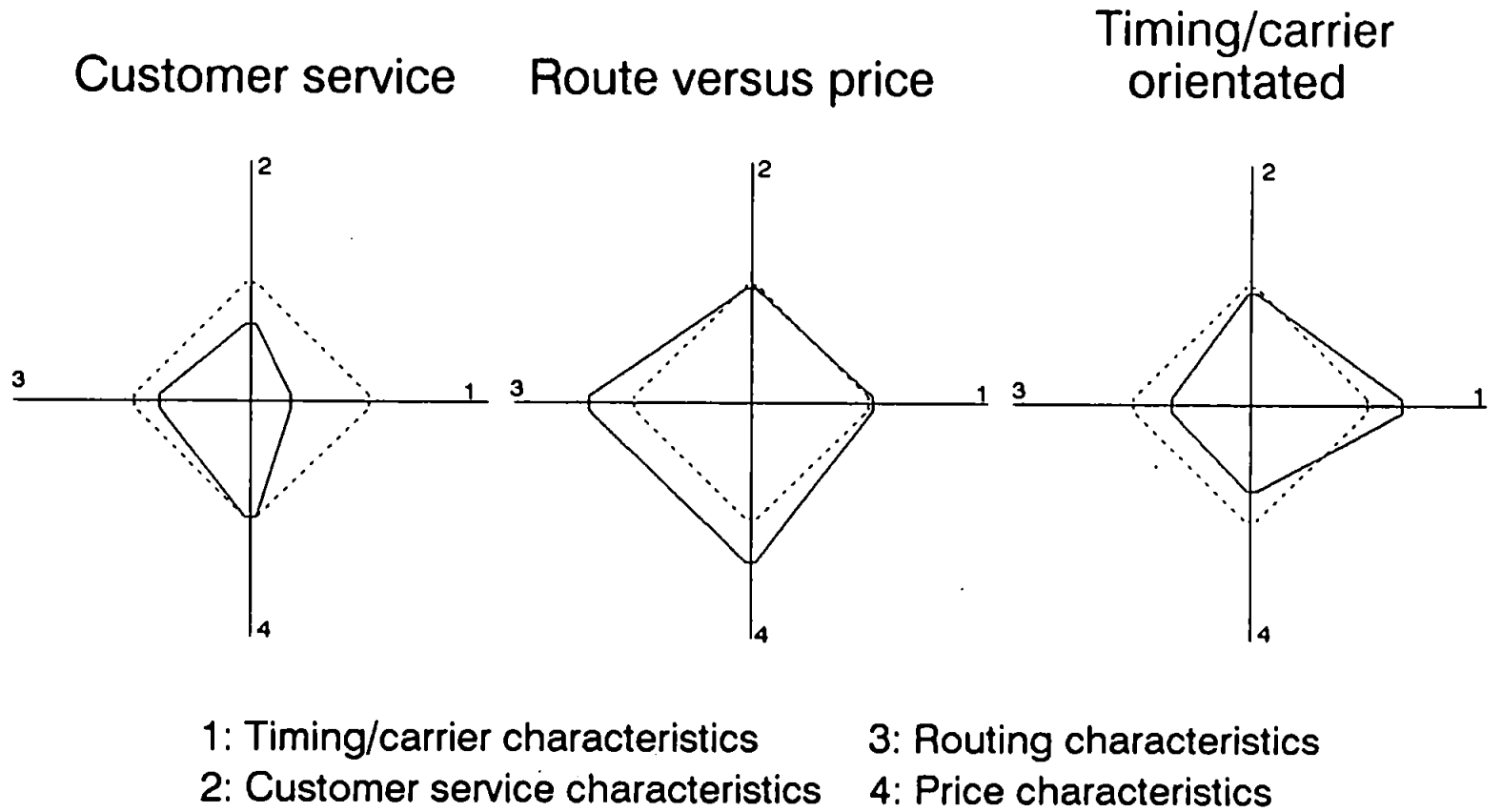
Table 12.11: Benefit segment labels: Freight agents purchasing sea services

Segment no. and size of segment	Important components	Unimportant components	Segment Label
1 (10)	Customer service	Timing/carrier Route (distance)	customer service
2 (18)	Route (distance) Price		Route *versus* price
3 (21)	Timing/carrier	Route (distance) Price	Timing/carrier orientated

12.2.3 Profiling benefit segments

The variables which differ significantly between the segments are as follows:

- The type of company

- Whether the company offers an airfreight service

- Whether the company offers a service to Australia (sig=0.0718)

- Whether the company offers a service to Asia

- Use of GB to Ireland sea services (sig=0.06)

- Use of GB to Ireland air services (sig=0.09)

- Use of Ireland to GB air services

- Total number of employees

Where the significance is below 0.05 the significance level has been included in brackets.

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Table 12.12: Profile of the 'customer service segment' segment, freight agents purchasing sea services

60% purchase services less frequently than daily
100% never purchase air services
100% do not offer an airfreight service
100% do not offer a service to either Australia or Asia
90% have 20, or fewer, employees in total
80% have a turnover less than £1million

The Customer service segment

The 'customer service' segment is the smallest segment developed among companies purchasing sea freight services between GB and Ireland. The profile of this segment is summarised in table 12.12. The type of company belonging to this segment is less clear than for the other two segments as it contains a mix of freight forwarders, international carriers and other companies. The two key features of this segment are that it never uses air services and consequently does not offer an airfreight service and is composed of smaller companies, both with respect to the total number of employees and turnover of the company. Turnover only differs significantly (at the 0.09 confidence level) between the 'customer service' segment and the 'timing/carrier orientated' segment. Although this segment does not use air services, it purchases sea services from GB to Ireland less frequently than companies in the other two segments. The 'customer service' segment also differs from the other two segments in that none of its members offer a service to either Australia or Asia.

The distance *versus* price segment

The profile for the 'distance *versus* price segment' is summarised in table 12.13. Members of this segment predominantly describe themselves as international carriers. They appear to offer a wider geographical range of

Table 12.13: Profile of the 'distance *versus* price segment, freight agents purchasing sea services

83% are international carriers
44% offer an airfreight service
39% serve Australia and Asia
67% purchase GB → Ireland sea services
43% purchase GB → Ireland air services (sig=0.0963)
28% normally use the Belfast-Manchester route
28% use the Belfast-Glasgow route sometimes
45% employ over 50 people in total

services with the highest proportion of members offering services to Australia and Asia. Australia and Asia are the only two regions to differ between the segments in terms of areas served. The 'distance *versus* price' segment contains the highest proportion of companies which offer an airfreight service yet members of this segment appear to have a more moderate level of usage of air services between GB and Ireland than the 'timing/carrier orientated' segment. However, it contains the highest proportion of members who use two particular routes, Belfast-Manchester and Belfast-Glasgow. This segment contains a higher proportion of larger firms in terms of the total number of employees.

The timing/carrier orientated segment

The 'timing/carrier orientated' segment is the largest segment among companies purchasing sea services between GB and Ireland. A summary profile is presented in table 12.14. In contrast to the previous segment, this segment is predominantly composed of companies which describe themselves as freight forwarders. However, they have the same level of useage of GB to Ireland sea services as the 'distance *versus* price' segment. The 'timing/carrier orientated' segment makes the most frequent use of air services between GB and Ireland although a lower proportion of this segment offer

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Table 12.14: Profile of the 'timing/carrier orientated' segment, freight agents
purchasing sea services

80% are freight forwarders
19% offer an airfreight service
24% offer a service to Australia
19% offer a service to Asia
67% purchase GB → Ireland sea services
60% purchase GB → Ireland air services
43% have 21-100 employees in total
24% normally use the Dublin-Leeds route
33% have a turnover over £10million

an airfreight service. In terms of the total number of employees, there are
more middle sized companies in this segment although it does contain the
highest proportion of companies with less than 10 employees in total.

12.3 Freight agents purchasing air transport services

The profile of mean service attribute scores for air services is presented in
figure 12.9. Comparing this profile with that for the purchase of sea services
it appears that the 'time taken for the flight' attribute is less important
than the 'time taken for the sea crossing' attribute, but the 'proximity of
the airport to the origin and destination' of the goods is more important than
for the sea services. Other than these differences the profile is similar to the
profile for sea services with 'frequency', 'punctuality' and the 'availability of
freight space' being more important. A 'fast response to problems' is also
important. 'Shippers preference' again appears to be less important.
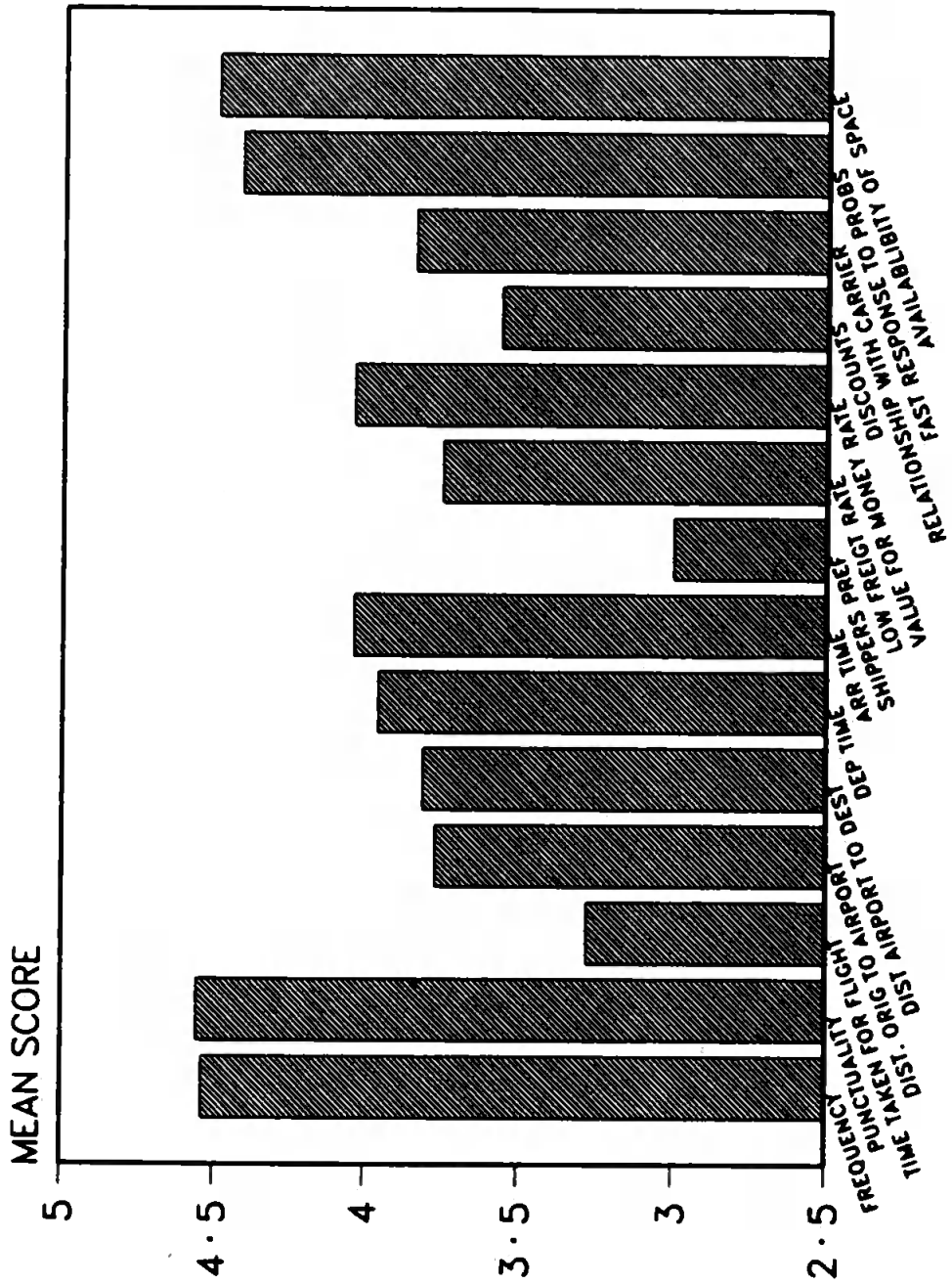
Figure 12.9: Mean scores for service attributes, freight agents purchasing air services

12.3.1 Principal components analysis

In common with the sea service, principal component analysis of companies purchasing air freight services also produces four components (see table 12.15). These components explain 79.9% of the variance. Although the percentage of variance explained by principal components is high, the matrix of factor loadings, following varimax rotation, is not as clearly defined. Some aspects of the service, namely 'high frequency of service' and the 'proximity of the airport to the origin and destination' of the goods, have high loadings on more than one component. The factor loadings for these service aspects have been included in table 12.15 in brackets. While this situation of service aspects loading highly on more than one component is not ideal, quartimax and equamax rotations of the matrix failed to converge and an oblique rotation would not have been appropriate given the use of squared euclidean distance in the clustering of respondents into segments. Where a service aspect overlaps components it is assumed to contribute more to the component on which it has the higher loading.

12.3.2 Benefit segment construction

Clustering on the factor scores produces two segments of the same size. The mean factor scores for the segments are presented in table 12.16. This table, in conjunction with the umbrella diagrams (see figure 12.10), is again the basis for labelling the segments. The labelled segments are presented in table 12.17. Transit time is the only component with a positive mean factor score in segment 2 and accordingly this segment has been labelled the 'transit time sensitive' segment. In the other segment transit time is the only component with a negative mean factor score. The highest mean factor score is attached to the price component and this segment has been labelled the 'good service at a reasonable price' segment. The two segments are almost mirror images of one another. If a component has a positive mean factor score in the transit time segment, the component is negative in

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Table 12.15: Principal components for freight agents purchasing air services

Principal component	service attributes loading>0.5	Components named
PC_1	Frequency of service (0.519) Punctuality Proximity origin to airport (0.505) Proximity airport to destination (0.552) Departure time of flight Arrival time of flight Fast response to problems Availability of space	Quality of service
PC_2	High frequency of service (0.602) Shippers preference Low freight rate Value for money freight rate	Price (but not in isolation)
PC_3	Short flight time Proximitry origin to airport (0.648) Proximitry port to destination (0.567)	Total transit time
PC_4	Special offers/discounts Relationship with carrier	Carrier relationship

Table 12.16: Mean factor scores for segments: freight agents purchasing air services. Numbers in segments are given in brackets.

Component	Mean factor score	
	Segment 2 (11)	Segment 3 (11)
Quality of service	-0.489	0.317
Price (not in isolation)	-0.252	0.505
Total transit time	0.665	-0.721
Relationship with carrier	-0.399	0.108

Table 12.17: Benefit segment labels, freight agents purchasing air services

Segment no. and size of segment	Important components	Unimportant components	Segment label
1 (11)	Total transit time	Quality of service Carrier relationship	Transit time sensitive
2 (11)	Price	Total transit time	Good service at a reasonable price

the more price orientated segment and *vice versa*.

12.3.3 Profiling benefit segments

The differences between the 'transit time sensitive' segment and the 'good service at a reasonable price' segment are summarised in table 12.18. The main conclusion to be drawn from this comparison is that members of the 'travel time sensitive' segment purchase more sea transport services while the 'good service at a reasonable price' segment is predominantly concerned with the purchase of air services. The 'good service at a reasonable price' segment appears to provide services for a more varied mix of consignments

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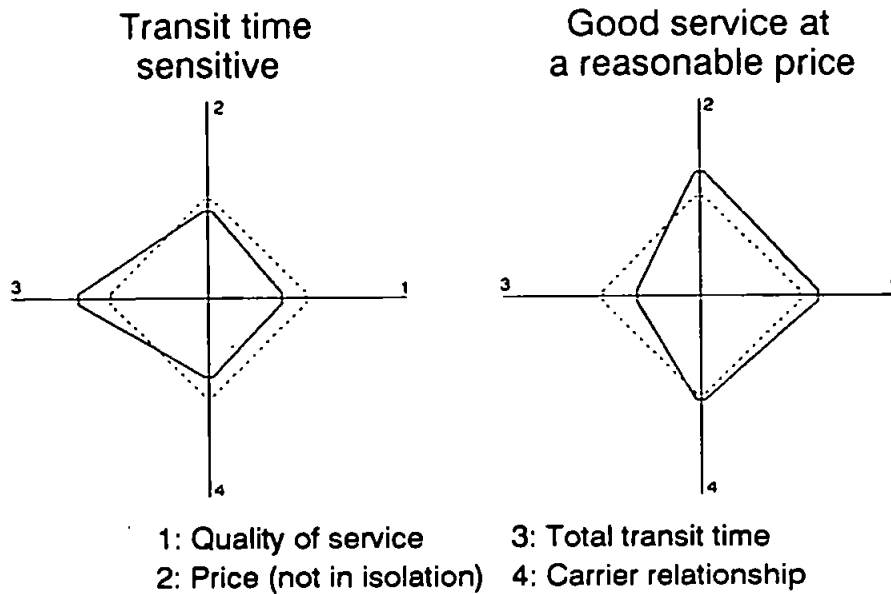
Figure 12.10: Freight agents purchasing air services, umbrella diagrams

and persons responsible for purchasing appear to have had more experience than their counterparts in the time sensitive segment.

12.4 Summary

12.4.1 Principal components analysis

In the freight shipper market four components which have been previously recognised (Gray 1985; McGinnis, 1980; Roberts, 1971) to be important in choice of freight service have been developed:

- carrier characteristics

- route characteristics

- timing characteristics

- price characteristics.

Table 12.18: Freight agents purchasing air services, differences between segments

The transit time sensitive segment	The good service at a reasonable price segment
Whether a door-door full accompanied trailer service is offered	
91% offer service	less than 10% offer service
Frequency GB to Ireland sea service is used	
All use this service daily	50% use this service daily
Use of Dublin-London route	
Fewer than 20% use this route	Usual route for 36%
Variety of products	
54% highly varied	100% highly varied
Time in position	
55% 5 years or less	75% more than 5 years

Table 12.19: Components important in purchase of freight services

Sea service	Air service
Timing/carrier characteristics	Quality of service
Customer service characteristics	Price characteristics
Routing characteristics	Total transit time
Price characteristics	Relationship with carrier

A fifth factor, control over the involvement of other parties in the buying decision also emerges.

Four components are developed for freight agents involved in the purchase of both air and sea services (table 12.19). The quality of service component for the purchase of air services is broader than the customer service component in the purchase of sea services. The quality of service component encompasses parameters of the service, for example, schedule and proximity aspects, whereas the customer service component is confined to the performance of the service, for example, punctuality, response to problems. The relationship with the carrier is more important in the purchase of air services and timing characteristics are more important in the purchase of sea services. Carrier characteristics also appear to be more important in service choice among freight shippers.

12.4.2 Construction of benefit segments

Rather different segments are constructed for shippers and agents (both sea and air purchases) in the freight market. Despite any similarity in the components determining service choice, the disparity in the benefit segments suggests that different combinations of the components are indeed important for different groups of customers.

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12.4.3 Profiling benefit segments

Few differences are detected between benefit segments for freight shippers, two of the three profiling variables which differ significantly between segments are concerned with care required by products and the other one with how frequently air service is used. No characteristics of the company or the person answering the questionnaire are involved in profiling. This is disappointing as it does not contribute to knowledge of how decisions are made or the working of the decision making unit. However, more differences exist between pairs of segments and these belong to all categories of data required.

For freight shippers, variables concerned with product characteristics are the most useful, in terms that they identify differences between the benefit segments, of the categories of profiling variables. For freight agents, the operation and current use categories of variables are more useful in profiling benefit segments in the purchase of both sea and air freight transport services.

Part IV

Discussion

Chapter 13

Conclusions, discussion and recommendations

This research represents the first successful application of benefit segmentation to a short-sea passenger and freight transport market. In so doing it has addressed two areas which to date have been relatively under researched:

- Market segmentation in the transport industry

- The Irish sea passenger and freight transport market

The lack of research in exploring the need for freight services has been particularly criticised by McGinnis (1980). This research goes a little way in rectifying this area of neglect also. The current research is unique in its parallel treatment of four markets:

- the sea passenger market

- the air passenger market

- the freight shippers market and

- the freight agents market.

The parallel treatment of the markets allows comparisons to be made:

- between passenger and freight markets. Passengers and freight are carried in the same vessel and the requirements of the two markets must be reconciled, and

- between the ferry and air passenger markets. Competition from airlines is a key concern for the ferry operator.

This final chapter presents some general conclusions of the research. The main role of the chapter however, is to respond to issues and questions raised in the introductory part of the thesis. The chapter concludes by identifying areas for further research.

13.1   Conclusions

The three hypotheses presented in the conceptual model have all been tested. It is concluded that:

- The decision to purchase the service may be considered to be influenced by a number of components, or elements of the service. Service choice for all markets may therefore be expressed:

$$Service\ choice = f(PC_1, PC_2, \dots, PC_n) \qquad (13.1)$$

where $PC_1, \dots, PC_n$ are the components which are developed as being important in choice of service.

Passengers and freight purchasers of the service do purchase the service on the basis of a combination of attributes. Therefore the first hypothesis is accepted. The same core of components are important in determining choice of service for both sea and air passengers.

- Different groups of passengers and freight customers, in both the sea and air markets, do choose the service on the basis of different combinations of components. Therefore, the second hypothesis, that benefit segments exist in the market can also be accepted.

- The third hypothesis that benefit segments can be profiled in terms of independent variables is also accepted. Travel behaviour, buying behaviour and demographic variables are used in the passenger market with the reservation that buying behaviour variables have not proved very useful in profiling benefit segments. Benefit segments in the freight market have been more difficult to profile. Product characteristics have been more useful for freight shippers. Variables concerned with the operations of the company and the Irish sea transport services currently used by the company are more useful in profiling benefit segments among freight agents.

Chapters 10, 11 and 12 provide the input to the Benefit Segmentation Model. The BSM treats car and foot passengers on the different routes as individual markets. For each route operated by Sealink Stena Line on the Irish Sea, benefit segments have been constructed and profiled. Factors, or components of the service, which are more and less important to segments in making the choice of service are identified. The needs of the passengers on a particular route must be reconciled with the needs of the freight market who may also use the service contemporaneously. The ferry operator must also be aware of the threat from the air operators, some groups of passengers in the ferry and air market appear to have similar requirements from the service.

13.2   Discussion

13.2.1   Competition

In the introductory section (Chapter 2) it was suggested that operators perceive price to be the major basis for competition and that the high level of competition is a function of the overcapacity in the market. Quality of service was also deemed to be important.

Principal components analysis of the car passengers shows that differences do exist between passengers with respect to the importance of low price in the choice of the service. There is at least one group of car passengers (or segment) on each route who do not choose the service on the basis of price. The importance of price among foot passengers should not be understated, price is important to all foot passengers. Because of the lack of variation between foot passengers with respect to the importance of price in the survey results, it has not been possible to examine the relationship between price and other factors important in choice of service, which do vary between foot passengers according to the survey. With the overriding importance of price for foot passengers, a market segmentation strategy may not be appropriate as all segments may respond in a similar way to changes in price. A cost leadership strategy in which the operator does not look for differences between passengers, but concentrates on providing a lower cost service than competitors, may be more effective in the foot passenger market. If all passengers are going to respond in a similar way to changes in price, the effort in developing and profiling benefit segment among these passengers might be better spent elsewhere. The ferry operator is, in general, likely to be less concerned about foot passengers and concentrate on attracting greater use of the service from car passengers. Car passengers tend to have higher incomes than foot passengers and purchase more expensive tickets for the crossing.

The importance of a high standard of service on board a ferry is another

source of variation between passengers. Among foot passengers there is at least one group of passengers on each route for whom on board service is not important. The provision of on board facilities appears to be a useful basis for competition. Two factors concerned with on board facilities emerge from principal components analysis of the sea passenger market and it has been suggested in chapter 11 that on board facilities may be important in choice of sea service as opposed to an air service.

The overcapacity in the market allows passengers to have a short booking time. Passengers obviously do not feel any pressure to book their crossing early to be sure of space on the required crossing, particuarly in the 'off-peak' season. This can have serious implications on staffing and catering requirements. It is difficult to plan the number of staff which will be required on a sailing and the number of staff on board cannot be changed in the short-term. One way of reducing the uncertainty about the number of passengers which will be carried on a crossing may be to introduce incentives for passengers to book early, perhaps some form of discount if the ticket is booked one or two weeks in advance.

13.2.2 Seasonality

The high level of seasonality, particularly in the sea passenger market was identified in chapter 2. The preliminary analyses provide structure to the seasonality as they suggest the different types of passenger likely to travel at the different times of the year; for example, there are a higher proportion of passengers travelling for business on the Larne-Stranraer route during the winter months. Seasonality does not exist in the air market to the same extent and few seasonal differences are identified in this market.

Given that the preliminary analysis identifies seasonal difference in the market it might be expected that different benefit segments could be developed at the different times of the year. This has not been explored, but only one data set suggested that seasonal differences exist between benefit segments.

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It is suggested in chapter 2 that the lower level of seasonality in the air market may indicate a different type of passenger and that the more consistent volume of traffic in the air market was due to a greater amount of business passengers, and that holiday traffic had a lesser effect on the air market. The preliminary analysis supports this assertion with a predominance of business passengers in the air market at all times of the year.

13.2.3   The freight market

In chapter 2 it was suggested that the volume of freight traffic on the Larne-Stranraer route was higher than on the other two routes because of the short crossing time and the frequency of sailings on this route. Preliminary analysis of the freight agents purchasing sea transport services found the Larne-Stranraer route to be the most commonly used sea route. There is a segment for whom the distances between the port and the origin and destination of the goods is important among the agents. Profiling does not suggest whether it is this segment which uses the Larne-Stranraer route to a greater extent than any other segment. This may be explored through further research.

Chapter 2 also identifies imbalance as the dominant feature of the Irish sea freight transport market, with a greater movement of goods into, as opposed to out of Ireland. Preliminary analysis (chapter 9) of the shippers market concurs with this in finding a greater movement of goods into Ireland. Few freight agents in the survey admit to suffering from an imbalance in the freight flows into and out of Ireland.

Competition in the freight market was also perceived to be based on price, but ferry operators allowed that quality of service may also give grounds for competition (Matear, 1987). The importance of price in the choice of service also varies between customers in all parts of the freight market, supporting the premise of price competition but there is no indication that quality of service forms a basis for competition.

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13.2.4 Relationship between the passenger and freight markets

In chapter 3 Rich (1980) comments on the desireability of carrying both passengers and freight in the same vessel. Whether this is unattractive to either market is not specifically addressed in this research. The passenger market seems either to be fairly unaware of, or to accept, the presence of the freight market. For its part, the freight market recognises that frequency of sailing, made possible by carrying passengers, is an important element in the service choice decision.

13.2.5 The benefit segmentation model

Expectations of the BSM were presented in chapter 4:

- what changes or improvements to make to the service, how to adjust the marketing mix.

- which segments to target

- how to reach different segments

- how different segments respond to changes in the marketing mix.

This section assesses the extent to which these expectations have been met.

Each element of the marketing mix has an integral role in resource allocation. The elements of the marketing mix are discussed below.

- **Price** The segmentation analysis has identified groups of passengers for whom price is more or less important. The relative sizes of these segments is important. If there is a large price sensitive segment, perhaps a 'premium standard' service could be introduced, for which passengers might pay a slightly higher price, or on a smaller scale, a first class lounge could be introduced. This has already happened on

the Holyhead-DunLaoghire route where for a charge, passengers may use the 'Pullman lounge'. This facility could be extended to other routes.

- **Place** The place where the service is purchased emphasises the importance of a good relationship between the ferry operator and the ticket outlet. A large proportion of tickets in the passenger market are purchased from a travel agent. Therefore, the marketing strategy must attract the travel agent, or 'middleman', as well as the passenger.

- **Promotion.** The high proportion of repeat users in the passenger market suggests that enjoyment of the ferry crossing is perhaps the best promotion which the company can receive. This emphasises the need for the operator to be aware of and cater for the needs of its passengers to ensure the service is enjoyed.

- **People.** On board service, which includes the friendly attitude of crew and staff is identified as important to certain groups of passengers.

- **Physical evidence.** The on board environment, for example, the decor of the vessel or design of the passenger accomodation, is found to be important for groups of passengers, a reminder that essential physical evidence should not be ignored. The pleasant environment may also contribute to the popularity of the pullman lounge.

- **Product.** The ferry company must clearly define the product or service which it is offering to the passenger. Are they simply offering a ferry crossing from A to B. It appears that this is all that is required by some foot passengers, the 'service unimportant', 'basic service only' and 'generally dissatisfied' segments. Or as Rich (1980) suggests, is the company offering a 'mini cruise' which is an integral part of a holiday. The importance placed on facilities and on board services by large numbers of passengers, particularly among car passengers, suggests that passengers do want something more than simply a ferry

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crossing.

The different patterns of buying behaviour provide means of communicating with segments. For example, different advertising messages could be displayed in Sealink shops and travel agents depending on the service required by the passengers who purchase tickets from those outlets.

The difficulty in determing which segments to target and how these segments will respond to changes in the marketing mix are discussed in the section 13.3.

13.2.6   Resource allocation

The role of the benefit segmentation model is to guide resource allocation. The first stage of the benefit segmentation analysis (principal components analysis) indicates the key competitive areas for the company. This allows the operatorsto identify competitive areas which they can address, for example, on board facilities, as opposed to those which they may not be able to address, for example, sailing time or travel time. Thus the principal components analysis identifies the broad areas where company resources may be allocated.

Principal components analysis does not however indicate which of the components may be more important to certain groups of passengers. This is achieved by the construction of benefit segments. Calculation of the mean factor scores for benefit segments identifies the components which are more important to particular groups of passengers. Therefore, resources may be more closely targetted to attract certain groups of passengers, for example, 'facilities orientated' passengers.

Profiling the benefit segments in terms of their travel behaviour, buying behaviour and demographic characteristics allows resources to be more specifically targetted to particular passengers, for example, high income passengers or frequent travellers. If the company proposes to commit resources to

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a particular segment it will wish to ensure that the segment is aware of this attention to their needs.

The allocation of resources to match the requirements of the benefit segments existing in the market forms the basis for the company's marketing strategy.

13.2.7 Implications of the research

For the ferry operator

Gains from the research for the ferry operator are twofold:

1. The preliminary analysis provides detail of market structure and structural differences in the markets.

2. The benefit segmentation provides knowledge of why certain groups of car or foot passengers choose to travel on a particular route.

The ferry operator must also be aware of uncommitted passengers, those who may travel by air in the future should their circumstances change, for example, if a foot passenger was to have an increase in income. The ferry operator should be aware that there are groups of passengers in the air market with similar needs to some of the ferry passengers. The opportunity in this is that ferry companies could serve the air market but the threat is that the air market may attract the ferry passengers.

The segmentation analysis in this research does offer the advantages of the approach suggested by Engel *et al.* (1972):

1. It provides a means of assessing competition. The areas where passengers differ are identified through the principal components analysis. These may provide bases for competition.

2. The capability of management to respond to changes in demand should be increased by improved market knowledge.

3. More precise targets may be set. For example, the ferry operator may set a target of attracting more passengers who are more sensitive to travel time but less sensitive to price on the Larne-Stranraer route.

Implications for airports and air service operators

Airport operators also gain knowledge of market structure and reasons why groups of passengers use a particular airport. The air market is dominated by passengers who are travelling for business. Other research has suggested (Shaw, 1985; Vambrey, 1976) that business passengers are less price sensitive. This has implications for pricing policy with the potential for a price discrimination strategy. It may be possible to sell the majority of seats to business passengers at a higher price and the remaining seats to non-business passengers on a marginal cost basis. This is widely used pricing strategy in the air industry. The time sensitivity of the business passenger may also offer a basis for competition.

The concept of segment mobility is important to the air operator, particularly for passengers who travel more frequently. The experience of the service while travelling for business will influence the choice of service when travelling for non-business reasons. The air operator (and the ferry operator) must be aware that membership of a particular segment may not be permanent and that the needs of individual passengers will change over time, for example, passengers may move from a schedule sensitive segment to one where service is more important.

The research does not include the influence of the carrier on the choice of service. The benefit segmentations may be more useful to management in the air market as each airport only has to evaluate or assess two sets of benefit segmentations, business and non-business passengers at their airport. This is in contrast to the six sets which have to be comprehended by the ferry managers. However, ferry routes enjoy a degree of autonomy from one another. The Larne-Stranraer route is independently managed from the

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Holyhead-DunLaoghaire and Fishguard-Rosslare routes. Management may therefore wish to assess the results for the three routes independently.

Implications for operators of freight transport services

The imbalance in the market continues to be a major area of concern in the freight market. The freight shippers market is not divided into air and sea sectors prior to the construction of benefit segments. There is a suggestion that sea freight transport services are used for routine perishable and routine non-perishable goods while air services are used less frequently for more urgent deliveries.

Implications for other transport operators

This research has concentrated on the ferry and air transport markets. It should be remembered that for many passengers the ferry crossing or flight is only one element of the total journey and the other parts of the total journey will also influence the choice of service.

Implications for academics

This research has demonstrated that benefit segmentation may be applied to the short sea passenger and freight transport market on the Irish sea. The data collection methodology performed well under a variety of conditions, on board the ferries and at the different airports. The on board approach is recommended for studies which involve collecting data in these markets. The umbrella diagrams provide a cogent and concise means of identifying the service aspects which are important to different groups of passengers.

The analytical methodology was employed in both the passenger and freight markets. These markets differ considerably in both size and structure. The methodology performed well in both markets. The versatility of the analytical methodology suggests that it may be employed in the construction of

benefit segments in other markets, including those with combined consumer and industrial customers.

13.2.8 Application to other markets

A problem of segmentation studies is that they tend to be specific to the market in which they were conducted. Unfortuneatley this research does not appear to be an exception to this criticism. The main difficulty in offering general conclusions is that different benefit segments have emerged on the different routes for both car and foot passengers. Certain consistencies exist between the routes in the development of components influencing choice of service. This suggests that results from principal components analysis could be applied to other markets. Any generalisations of results should only be made with extreme caution.

13.2.9 The academic/practitioner gap

Another common criticism of segmentation studies is that they do not bring academics and marketing practitioners any closer together. This research was conducted in close collaboration with the ferry company and the airports. The dissemination of the results to the industry should help in the development of their marketing strategies and contribute to the closing of the academic/practitioner gap in this industry.

13.2.10 Comparison of preliminary analysis and benefit segmentation analysis

Having undertaken both benefit and *a priori* (in the preliminary analyses) segmentations of the market the question arises as to whether either of the segmentation approaches is superior. This question is only pertinent to the passenger market as *a priori* segmentations are not undertaken in the freight

market.

The criteria suggested by Frank *et al.* (1972) for evaluating different bases for segmentation have not proved to be very useful in comparing benefit and *a priori* segmentations:

- Both approaches produce homogeneous segments although the response to marketing variables is unknown.

- Both are measureable.

- Both approaches produce segments which are accessible.

- Any increase in profitablity resulting from segmentation could only be assessed after a strategy has been implemented, and then with difficulty.

Benefit segmentation is employed because it may be used in both the consumer and industrial markets. Benefit segments are more useful in that they suggest *why* the service is chosen and provide an understanding of the needs of particular markets.

In contrast, *a priori* segments from the preliminary analysis are easier to construct. The detailed, complicated data required for the construction of benefit segments are not required. Much of the other data could be collected through the ticketing system. It should be relatively straightforward to collect buying behaviour variables when the ticket is purchased. It should be recalled that buying behaviour variables are not particularly useful in profiling benefit segments. Travel behaviour variables could also be collected at the point of ticket sale, for example, whether the passenger is travelling with a car or on foot. Demographic characteristics and purpose of travel would be more difficult to collect in this way, but the idea of utilising the potential of Computer Reservation Systems or other on-line booking system for market research could be explored.

Ease of profiling may be one way of evaluating the relative merits of *a priori*

and benefit segments. Benefit segments appear to be more useful for business passengers in the air market as no seasonal differences exist between business and non-business passengers at a particular airport, but differences do exist between the benefit segments at airports.

The preliminary analyses appear to be more useful in responding to structural questions raised in the introductory part of the thesis, such as seasonality.

13.2.11   Criticism

A criticism of this research is that it is difficult to comprehend the level of detail provided by the benefit segmentation and the breadth of market coverage across four markets. The benefit segmentation analyses in the freight market are at a different level of market detail and do not integrate particularly well with findings in the passenger markets. The benefit segmentation in the passenger markets may be at too fine a level of detail for this initial application of the benefit segmentation concept to a complex market.

There are two alternative approaches which could have been adopted:

1. One alternative would have been to construct benefit segments for the sea and air passengers markets as a whole or, for all car and all foot passengers in the sea passenger market and for all business and non-business passengers in the air market. This would determine if the benefit segmentation approach distinguishes between car and foot passengers or business and non-business passengers. By conducting the benefit segmentation for car and foot passengers on the different routes, implicit assumptions that car and foot passengers on the different routes have different needs are made, but not tested. The same criticism may be levelled at the air market where benefit segmentation is conducted for business and non-business passengers at the three airports.

The more general approach may be more helpful in identifying different aspects which are important in choice of sea and air services and how the requirements of the freight market can be related to the requirements of the passenger market.

2. The second alternative is to concentrate on only one route with the aim of increasing the relevence of the findings to management. This approach would address the particular needs of passengers and freight customers on that route. The BSM could then be extended to consider ways of implementing the findings of the benefit segmentation analysis.

Methodolody

Some criticism of the methodology may also be made at this point.

The list of service attributes used in the questionnaires may not be complete. There may be other attributes which play a role in service choice for some passengers. This list of attributes used in this research was compiled from the transport service choice and transport segmentation literature. The use of an 'other' question in the questionnaire did not yield any other attributes which were consistently offered. Therefore, it is felt that the existing list is sufficient to form realistic benefit segments.

The existence of large groups (see, for example, the group travelling to a swimming competition in section 7.4.5) in the sampling frame was noted in the preliminary analysis of the ferry passenger market (chapter 7). While these large groups do not appear to have influenced the results of the benefit segmentation analysis the company should be aware of their existence as they have the potential to make the results less valid.

A further point to be aware of is that the person who answers the questionnaire (the service user) is not necessarily the person who has selected the service. This comment is particularly pertinent to business travellers in the air passenger market where the ticket may have been purchased by a

secretary or through a company travel agent.

13.3 Recommendations for further work

A comprehensive and detailed database of passenger and freight purchases of Irish sea transport services has been assembled and the potential for further analysis of this database is considerable.

13.3.1 *A priori* segmentations

One area offering great potential for further work is the preliminary analyses, or *a priori* segmentations. There is plenty of scope for many more bases, and combinations of bases, to be used in segmenting the market, for example, purpose of journey or distance travelled to and from the ports, may contribute further to the understanding of the market. Exploration of the daily variation in sailings may be relevant for both the passenger and freight markets.

13.3.2 Stability of segments

This research was conducted over the period of a year. While this is sufficient to identify seasonal variation in the markets, it is not possible to identify longer term structural changes in the market. Would the same benefit segments be constructed the next year?

13.3.3 Profiling

The problem of defining segments is recognised to be one of the most difficult and most researched aspects of segmentation. It is the source of much criticism of the concept and felt to be a major contributor to the gap between academics and marketing practitioners. There is no point in develop-

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ing segments which cannot be dealt individually by management. Profiling variables must be directly relevent to management.

Further work is required with respect to the profiling of benefit segments. Univariate methods of comparison seem to have relatively limited potential, although they do have a considerable advantage in ease of interpretation. This ease of interpretation is important in persuading management to use the results. An alternative approach to profiling would be to employ multivariate techniques in which ombinations of profiling variables may be used to predict segment membership, for example, discriminant analysis, multiple regression or log linear models.

13.3.4   Which segments should the operators concentrate on

A question which has not been addressed in this research is how does the operator decide on which segments to concentrate or focus marketing activities. To answer this thoroughly it would be necessary to determine the different response functions of the segments to the marketing mix variables. Without this knowledge, this segmentation falls into the behavioural school in that it contributes to the understanding of the market, why different groups of passengers select a particular service, but does not suggest which segments may be more responsive to the marketing activities of the company, which is the essence of the normative school. Frank and Massey (1975) contend that a crucial criterion for segmenting a market is whether the segments have different elasticities of demand in response to pricing and promotional policies. This response elasticity data is particularly pertinent to resource allocation within the MSFM. Collection of this data would be an important advance.

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13.3.5 Past market behaviour

The conceptual model proposes a relationship between the current operation and past market behaviour. Scope exists to examine this relationship more closely by subjecting the past behaviour of the market to time series analysis. Preliminary work in this field yielded some interesting results such as the possibility of chaotic behaviour in the markets but further investigation proved to be outside the focus of the current research. This is a very exciting area for further research.

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Appendix A

Questionnaire for Sea Passengers

Questionnaire ref. no. _____

Dear Sir or Madam,

This questionnaire is part of a very important research project currently being carried out at Polytechnic South West in Plymouth to discover how people travel across the Irish Sea. I would like to ask you to help with this research by completing this questionnaire. It should not take long and your help will be very much appreciated. All the replies will be treated confidentially. If you have any queries or would like to know more about the research please contact me at the address at the end of this questionnaire. If you would be willing to help further with this research <u>and</u> would like to be entered into a free draw to win a holiday, please fill in your name and address in the space provided.

Thank-you in advance for your co-operation.

Yours sincerely,
Sheelagh Matear.

Question 1
Please enter: todays' date:...
name of vessel:.....................................
scheduled departure time:...................... am/pm*
scheduled arrival time:.......................... am/pm*
* delete as appropriate

Question 2
Please tick the route and direction you are travelling on:

Stranraer to Larne	☐1	Larne to Stranraer ☐4
Holyhead to DunLaoghaire	☐2	DunLaoghaire to Holyhead ☐5
Fishguard to Rosslare	☐3	Rosslare to Fishguard ☐6

Questionnaire ref. no. _____

Question 3

Each of the following points refers to some part of the ferry service you are travelling on. Please ring the number on the scale which describes how important or unimportant that point is to you. A score of 5 indicates the point is very important while a score of 1 means that point is very unimportant.

	very unimportant				very important
(1) Route of sea crossing	1	2	3	4	5
(2) Time taken for sea crossing	1	2	3	4	5
(3) Total travel time to your destination	1	2	3	4	5
(4) Day of week of ferry departure	1	2	3	4	5
(5) Time of day of ferry departure	1	2	3	4	5
(6) Short time required between check-in and departure	1	2	3	4	5
(7) Short distance to travel to the ferry terminal	1	2	3	4	5
(8) Short distance to travel from the ferry to your destination	1	2	3	4	5
(9) Easy to book	1	2	3	4	5
(10) Baggage handling facilities available	1	2	3	4	5
(11) Low price	1	2	3	4	5
(12) Availability of 60 hour and 120 hour return fares	1	2	3	4	5
(13) Friendly attitude of crew and staff	1	2	3	4	5
(14) Good on board service	1	2	3	4	5
(15) Good quality food	1	2	3	4	5
(16) Cheap food	1	2	3	4	5
(18) Other on board shops	1	2	3	4	5
(19) On board entertainment	1	2	3	4	5
(20) Sleeping accommodation	1	2	3	4	5
(21) Availability of a motorists lounge	1	2	3	4	5
(22) Pleasant on board decor	1	2	3	4	5
(23) Facilities for children	1	2	3	4	5
(24) Facilities for disabled persons	1	2	3	4	5
(25) Safety information	1	2	3	4	5
(26) Good rail connection at both ports	1	2	3	4	5
(27) Good bus connection at both ports	1	2	3	4	5
(28) Good road connections at both ports	1	2	3	4	5

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Question 4

Are there any other points which you considered when deciding to use this ferry service? Yes ☐ No ☐   If no, please go to *Question 6*
                                             If yes, please go to *Question 5*

☐₅₉

Question 5

If yes, what are these points and what score on the 1-5 scale in *Question 3* would you give them?

....

....

....

60 [grid] 64
65 [grid] 69
70 [grid] 74

Question 6

Looking at the list of points in *question 3* and any you may have added, what single point was the most important to you in choosing this ferry crossing?

....

75 ☐☐ 76

Question 7

What single point was the next most important? ....

77 ☐☐ 78

Question 8

What single point was the least important? ....

79 [boxes] 80

Question 9

What is the main purpose of your trip?
    Holiday ☐₁   Business ☐₂   Other ☐₃ please specify...........................

If you are on holiday, are you visiting friends and/or relatives?
            Yes ☐₁   No ☐₂

1 [boxes] 4
5 [boxes] 8
2 9
10 [boxes] 11
12 [boxes] 15

☐₁₆

Question 10

    Is this your outward or return journey? Outward ☐ Please go to *Question 11*
                                             Return ☐ Please go to *Question 12*

Question 11

How long do you intend to be away for?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐₁	☐₂	☐₃	☐₄	☐₅

☐₁₇

☐₁₈

Please continue from *Question 13*

Question 12

How long have you been away for?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐₁	☐₂	☐₃	☐₄	☐₅

☐ 19

Question 13

Which is the nearest town to where you set out from?................................

20 ☐☐☐☐ 23

Question 14

Did you set out from your: normal residence ☐ 1
                              place of work ☐ 2
                              other relative's home ☐ 3
                              place of holiday ☐ 4
                              other ☐ 5 please specify....................

25 ☐☐☐☐ 28   ☐ 24

Question 15

Which is the nearest town to where your journey will finish?...........................

29 ☐☐☐☐ 32

Question 16

Will your journey finish at your: normal residence ☐ 1
                              place of work ☐ 2
                              other relative's home ☐ 3
                              place of holiday ☐ 4
                              other ☐ 5 please specify
....

34 ☐☐☐☐ 37   ☐ 33

Question 17

Is this the first time you have used Sealink on this route?

Yes ☐   No ☐

☐ 38

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Question 18

How many times in the last 12 months have you travelled between Great Britain and Ireland? Please indicate which crossings you have used and the number of times you have used them. Please count a return journey as 1 journey in each direction on the appropriate route.

	number of times		number of times
Stranraer to Larne	☐ 1	Larne to Stranraer	☐ 2 ....
Holyhead to DunLaoghaire	☐ 3	DunLaoghaire to Holyhead	☐ 4 ......
Fishguard to Rosslare	☐ 5	Rosslare to Fishguard	☐ 6 ....
Liverpool to DunLaoghaire	☐ 7	DunLaoghaire to Liverpool	☐ 8 ....
Other ferry GB→Ireland	☐ 9	Other ferry Ireland→GB	☐ 10 ......
Air service GB →Ireland	☐ 11	Air service Ireland→GB	☐ 12 ......

Question 19

Are you travelling with a car? Yes ☐   No ☐   If yes, please go to *Question 2[*
Otherwise go to *Question 20*

Question 20

If you are not travelling with a car:

How did you arrive at the ferry?

Bus ☐ 1   Rail ☐ 2   Lift in car ☐ 3   Other ☐ 4 please specify

....

How will you continue your journey?

Bus ☐ 1   Rail ☐ 2   Lift in car ☐ 3   Other ☐ 4 please specify

....

Question 21

Are you travelling alone, or with family or friends?

Alone ☐ 1   With family ☐ 2   With friends ☐ 3   With family and friends ☐ 4

Question 22

How many people (including yourself) are in the group you are travelling with?

...........people

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Question 23

Please indicate, by ringing the appropriate number, how important you think it is that the following facilities or entertainments can be found on board a ferry. A score of S indicates you think that entertainment or facility is very important and a score of 1 means that it is very unimportant.

	very unimportant				very important
Bar	1	2	3	4	S
Games machines	1	2	3	4	S
Self service cafe	1	2	3	4	S
Restaurant	1	2	3	4	S
TV lounge	1	2	3	4	S
Cinema	1	2	3	4	S
Shop	1	2	3	4	S

Question 24

Have you any suggestions about other forms of entertainment or services you would like to find on board?...

....

....

Question 25

How did you find out about this ferry service?

Have used service before

From a travel agent

From a newspaper or magazine advertisement

Other form of advertising

Recommendation from family or friends

Other

please specify.........................

please specify.........................

Question 26

Where did you buy your tickets?

Travel agent   please specify agent and town................................

Sealink shop   please specify town..

British Rail   please specify town..

Coach company   please specify town..

Other   please specify...

Question 27

What type of ticket did you buy for this ferry crossing?

Sealink standard single for car and passengers ☐ 1
Sealink standard return for car and passengers ☐ 2
Sealink motorist 60 hour or 120 hour return ☐ 3
Sealink foot passenger monthly return ☐ 4
Sealink foot passenger single ☐ 5
British Rail single (standard/bluesaver*) ☐ 6
British Rail return (standard/bluesaver*) ☐ 7 *delete as appropriate
Coach company single ☐ 8 please specify company

....

Coach company return ☐ 9 please specify company

....

Other ☐ 10 please specify

....

☐ 45

☐ 46 ☐ 47
☐ 48 ☐ 49
50 ☐ ☐ ☐ ☐ 53
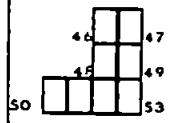
Question 28

Which of the following ticket concessions or special fares, if any, did you take advantage of on any part of your journey.

No concessions ☐ 1
Student or Young Persons discount ☐ 2
Family railcard ☐ 3
Senior citizen discount ☐ 4
Other ☐ 5 please specify.........................

☐ 54
55 ☐ ☐ ☐ ☐ 58
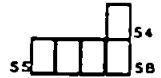
Question 29

Have you or do you intend to purchase a cabin berth or a pullman lounge seat?
Yes, a cabin berth ☐   Yes, a pullmann lounge seat ☐   No ☐

☐ 59

Question 30

How long before travel time did you buy your tickets?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

☐ 60

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Question 31
How often do you read a national daily paper?
Frequently ☐₁   Occasionally ☐₂   Never ☐₃
If never, go to *Question 33*
Otherwise go to *Question 32*

☐ 61

Question 32
What paper do you read most frequently?...

62 ☐☐☐☐ 65

Question 33
What is your age?

under 15	15-24	25-34	35-44	45-54	55-64	over 64
☐₁	☐₂	☐₃	☐₄	☐₅	☐₆	☐₇

☐ 66

Question 34
Are you male ☐ or female ☐

☐ 67

Question 35
What is your marital status? single ☐₁   married ☐₂   other ☐₃

☐ 68

1 ☐☐☐ 4
5 ☐☐☐ 8
4 9
10 ☐☐☐ 13

Question 36
Which is the nearest town to where you live?...

Question 37
What is your occupation?...

14 ☐☐☐☐ 17

Question 38
If you are married what is your spouse's occupation?...

18 ☐☐☐☐ 21

Question 39
Please tick which of these figures comes nearest to your annual household
income. Also please tick the currency in which you receive your income.
Currency: £ sterling ☐₁   Irish punts ☐₂   Other ☐₃ please specify
....

☐ 22

Less than 5000	☐₁	5000-10,000	☐₂	10,000-15,000	☐₃
15,000-20,000	☐₄	20,000-25,000	☐₅	25,000- 40,000	☐₆
More than 40,000	☐₇				

☐ 23

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Question 10

At what age did you (or will you) finish full time education?   ....years

2₄ ☐☐ 2ₛ

☐ 2ᵦ

If you would be willing to participate further in this research by completing either a postal or telephone survey and would like to be entered into the draw to win a holiday please fill in your name and address below. Your help will be very much appreciated. Please remember all replies are treated confidentially and that it will not be possible to identify individuals in any report.

Name:...

Address:...
....

Postcode:.................................... 'Phone number:......................................

If you have any queries about this research or would like to make any comments please use the space below. Please enter your name and address above if you would like a response to your query.

Please address any further queries to: Sheelagh Matear,
Department of Shipping and Transport,
Institute of Marine Studies,
Polytechnic South West,
Plymouth,
Devon.
England. PL 4 8AA

Thank-you for answering this questionnaire.

Appendix B

Proportional distribution of questionnaires

Table B.1: Proportional distribution of questionnaires

Survey	Route					
	Fishguard Rosslare		Holyhead DunLaoghaire		Larne Stranraer	
	Sailing	%	Sailing	%	Sailing	%
1	0900	30	2045	20	0800	18
	1500	35	0315	20	1130	17
	2140	20	0845	30	1530	22
	0315	15	1445	30	1900	26
					2230	11
					0300	6
2	1500	25	0845	25	1930	25
	2140	25	1445	25	0700	25
	0315	25	2045	25	1130	25
	0900	25	0315	25	1530	25
3	1500	25	0845	25	0800	25
	2140	25	1445	25	1130	25
	0315	25	2045	25	1530	25
	0900	25	0315	25	1900	25
4	1500	25	0845	25	1930	10
	2140	25	1445	25	2359	5
	0315	25	2045	25	0330	5
	0900	25	0315	25	0700	10
					1130	35
					1530	35

Appendix C

Statistical Tests

The Chi-squared test

The χ^2 staistic has been widely used throughout this research to test whether 2 variables are independent of one another. Two variables are independent if the probability that a case falls into a given cell is the product of the marginal probabilities of the 2 categories defining the cell. The probability of an observation falling into cell (ij) is estimated by

$$P = (row = i \ and \ column = j) = \left(\frac{count \ row \ i}{N} \right) \left(\frac{count \ column \ j}{N} \right)$$

(C.1)

The expected number of obervations in cell (ij) is obtained by multiplying the probability (equation C.1) by the total sample size

$$E_{ij} = \frac{(count \ in \ row \ i)(count \ in \ column \ j)}{N}$$

(C.2)

The χ^2 statistic is calculated using

$$\chi^2 = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

(C.3)

The χ^2 statistic only indicates whether a relationship *exists* between 2 variables. It provides little, or no information as to the strength or form of the relationship. A measure of the strength of the relationship may be gained using *Cramer's V*

$$V = \sqrt{\frac{\chi^2}{N(k-1)}} \tag{C.4}$$

where k is the smaller of the number of rows or columns.

Appendix D

Itineraries for sea passenger surveys

Table D.1: Itinerary for survey 1, Week beginning 21st August, 1990

Date	Sailing	Direction
Sunday 20th August, 1989	1500	Fishguard-Rosslare*
Monday 21st August, 1989	0900	Rosslare-Fishguard
	1500	Fishguard-Rosslare
	2140	Rosslare-Fishguard
Tuesday 22nd August, 1989	0315	Fishguard-Rosslare
	2045	DunLaoghaire-Holyhead
Wednesday 23rd August, 1989	0315	Holyhead-DunLaoghaire
	0845	DunLaoghaire-Holyhead
	1445	Holyhead-DunLaoghaire
Thursday 24th August, 1989	0800	Larne-Stranraer
	1130	Stranraer-Larne
	1530	Larne-Stranraer
	1900	Stranraer-Larne
	2230	Larne-Stranraer
Friday 25th August, 1989	0300	Stranraer-Larne
	0800	Larne-Stranraer*

* No survey

Table D.2: Itinerary for survey 2, Week beginning 20th November, 1989

Date	Sailing	Direction
Monday 20th November, 1989	1500	Fishguard-Rosslare
	2140	Rosslare-Fishguard
Tuesday 21st November, 1989	0315	Fishguard-Rosslare
	0900	Rosslare-Fishguard
	1500	Fishguard-Rosslare*
Wednesday 22nd November, 1989	0845	DunLaoghaire-Holyhead
	1445	Holyhead-DunLaoghaire
	2045	DunLaoghaire-Holyhead
Thursday 23rd November, 1989	0315	Holyhead-DunLaoghaire
	1930	Larne-Stranraer
	2359	Stranraer-Larne
Friday 24th November, 1989	0330	Larne-Stranraer
	0700	Stranraer-Larne
	1130	Larne-Stranraer
	1530	Stranraer-Larne
	1930	Larne-Stranraer*

* No survey

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Table D.3: Itinerary for survey 3, Week beginning 19th February, 1990

Wednesday 21st February, 1990	1500	Fishguard-Rosslare
	2140	Rosslare-Fishguard
Thursday 22nd February, 1990	0315	Fishguard-Rosslare
	0900	Rosslare-Fishguard
	1500	Fishguard-Rosslare*
Friday 23rd February, 1990	0845	DunLaoghaire-Holyhead
	1445	Holyhead-DunLaoghaire
	2045	DunLaoghaire-Holyhead
Saturday 24th February, 1990	0315	Holyhead-DunLaoghaire
Sunday 25th February, 1990	0800	Larne-Stranraer
	1130	Stranraer-Larne
	1530	Larne-Stranraer
	1900	Stranraer-Larne
Monday 26th February, 1990	0800	Larne-Stranraer*

* No survey

Table D.4: Itinerary for survey 4, Week beginning 21st May, 1990

Date	Sailing	Direction
Monday 21st May, 1990	1500	Fishguard-Rosslare
	2140	Rosslare-Fishguard
Tuesday 22nd May, 1990	0315	Fishguard-Rosslare
	0900	Rosslare-Fishguard
	1500	Fishguard-Rosslare*
Wednesday 23rd May, 1990	0845	DunLaoghaire-Holyhead
	1445	Holyhead-DunLaoghaire
	2045	DunLaoghaire-Holyhead
Thursday 24th May, 1990	0315	Holyhead-DunLaoghaire
	1930	Larne-Stranraer
	2359	Stranraer-Larne
Friday 25th May, 1990	0330	Larne-Stranraer
	0700	Stranraer-Larne
	1130	Larne-Stranraer
	1530	Stranraer-Larne

* No survey

Appendix E

Questionnaire for Air Passengers

POLYTECHNIC SOUTH WEST

Plymouth

Questionnaire ref. no. _____

Dear Sir or Madam,

This questionnaire is a very important part of research currently being carried out at Polytechnic South West in Plymouth to discover more about how people travel between Ireland and GB. I would like to ask you to help with this research by completing this questionnaire. It should not take long and your help will be very much appreciated. All the replies will be treated confidentially. A space is provided at the end of the questionnaire for any comments you may wish to make. If you have any queries or would like to know more about the research please write to me at the address at the end of the questionnaire. Please answer the questions on **both** sides of each page.
Thank-you in advance for your co-operation.

> Yours faithfully,
> Sheelagh Matear.

Question 1
Please enter: Today's date:...
                     Airport you are at now...
                     Airport you are flying to:...................................
                     scheduled departure time:...................... am/pm*
                     scheduled arrival time:.......................... am/pm*
* delete as appropriate

Question 2

Each of the following points refers to some part of the air service you are about to travel on. Please ring the number on the scale which describes how important or unimportant that point is to you. A score of 5 indicates the point is extremely important while a score of 1 means that point is extremely unimportant.

	extremely unimportant				extremely important
(1) Length of time taken for flight	1	2	3	4	5
(2) Total travel time to your destination	1	2	3	4	5
(3) Day of week of flight departure	1	2	3	4	5
(4) Time of day of flight departure	1	2	3	4	5
(5) Short time required between check-in and departure	1	2	3	4	5
(6) Easy to book	1	2	3	4	5
(7) Short distance to travel to this airport	1	2	3	4	5
(8) Short distance to your destination from the airport you are flying to	1	2	3	4	5
(9) Baggage handling facilities available	1	2	3	4	5
(10) Low price	1	2	3	4	5
(11) Availability of discount fares	1	2	3	4	5
(12) Friendly attitude of crew and staff	1	2	3	4	5
(13) Good quality food	1	2	3	4	5
(14) In flight entertainment	1	2	3	4	5
(15) Pleasant decor on board aircraft	1	2	3	4	5
(16) Facilities for children	1	2	3	4	5
(17) Facilities for disabled persons	1	2	3	4	5
(18) Safety information	1	2	3	4	5
(19) Good rail connection at both airports	1	2	3	4	5
(20) Good bus connection at both airports	1	2	3	4	5
(21) Good road connections at airports	1	2	3	4	5

Question 3

Are there any other points which you considered when you decided to travel on this flight ?   Yes ☐   No ☐ If no, please go to *Question 5*

If yes, please go to *Question 4*

Question 4
If yes, what are these points and what score on the 1-5 scale in *Question 2* would you give them?

....

....

....

57 | | | | | 61
62 | | | | | 66
67 | | | | | 71

Question 5
Looking at the list of points in *question 2* and any you may have added, what single point was the most important to you in choosing this flight?

....

72 | | 73

Question 6
What single point was the next most important? ....

74 | | 75

Question 7
What single point was the least important? ....

76 | | 77

Question 8
What is the main purpose of your trip?
Holiday ☐₁   Business ☐₂   Other ☐₃   please specify...........................

1 | | | | 4
5 | | | | 8
| | 2 | 9
10 | | 11
12 | | 14

☐₁₅

If you are on holiday, are you visiting friends and/or relatives?
Yes ☐₁   No ☐₂

Question 9
Is this your outward or return journey?   Outward ☐   Please go to *Question 10*
                                          Return ☐   Please go to *Question 11*

☐₁₆

Question 10
How long do you intend to be away for?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐₁	☐₂	☐₃	☐₄	☐₅

Please continue from *Question 12*

☐₁₇

Question 11
How long have you been away for?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐₁	☐₂	☐₃	☐₄	☐₅

☐₁₈

Question 12
Which is the nearest town in Ireland to where you started this journey?

....

Question 13
Which is the nearest town in GB to where your journey will finish?

....

Question 14
How did you arrive at the airport?

    Bus ☐₁   Rail ☐₂   Own car ☐₃   Lift in car ☐₄
    Taxi ☐₅   Other ☐₆   Please specify...............................

How will you continue your journey?

    Bus ☐₁   Rail ☐₂   Own car ☐₃   Lift in car ☐₄
    Taxi ☐₅   Other ☐₆   Please specify...............................

Question 15
Are you travelling alone, or with family or friends?
You may tick more than 1 box

    Alone ☐₁   With family ☐₂   With friends ☐₃

    With family and friends ☐₄   With business colleagues ☐₅

If you are travelling alone please go to *Question 17*
Otherwise please go to *Question 16*

Question 16
How many people (<u>including yourself</u>) are in the group you are travelling with?

                         ....people

Question 17
Please indicate how many times in the last twelve months you have used each of the following services and whether your trip was for business or pleasure?

	number of times	* delete as appropriate
Air service GB → Ireland	....	business/pleasure*
Air service Ireland → GB	....	business/pleasure*
Sea ferry service GB → Ireland	....	business/pleasure*
Sea ferry service Ireland → GB	....	business/pleasure*

472

Question 18

How did you find out about this air service?

Have used service before ☐ 1
From a travel agent ☐ 2
From a newspaper or magazine advertisement ☐ 3
Other form of advertising ☐ 4 please specify.........................
Recommendation from family or friends ☐ 5
Other ☐ 6 please specify.........................

Question 19

Where did you buy your tickets?

Travel agent ☐ 1 please specify agent and town..............................
Airline desk in airport ☐ 2
Other ☐ 3 please specify.......................................
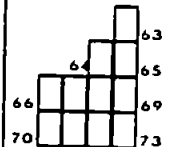
Question 20

Did you take advantage of any ticket concessions or special fares?

Yes ☐   No ☐   If yes, please go to *Question 21*
If no, please go to *Question 22*

Question 21

If yes, what were the concessions?

....
....

Question 22

Did you buy a single (one way) or a return ticket for this flight?

Single ☐   Return ☐
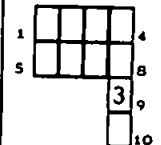
Question 23

How long before travel time did you buy your tickets?

less than 24 hours	less than one week	1 - 2 weeks	2 - 3 weeks	more than 3 weeks
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Question 24

How often do you read a national daily paper?

Frequently ☐ 1   Occasionally ☐ 2   Never ☐ 3

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Question 25
What paper do you read most frequently?..

13 ☐☐☐☐ 16

Question 26
What is your age?

under 15	15-24	25-34	35-44	45-54	55-64	over 64
☐$_1$	☐$_2$	☐$_3$	☐$_4$	☐$_5$	☐$_6$	☐$_7$

☐$_{17}$

Question 27
Are you male ☐ or female ☐

☐$_{18}$

Question 28
What is your marital status?   single ☐$_1$ married ☐$_2$ other ☐$_3$

☐$_{19}$

Question 29
Which is the nearest town to where you normally live?................................

20 ☐☐☐☐ 23

Question 30
What is your occupation?..

24 ☐☐☐☐ 27

Question 31
If you are married what is your spouses occupation?...................................

28 ☐☐☐☐ 31

Question 32
Please tick which of these figures comes nearest to your annual household income. Also please tick the currency in which you receive your income.
Currency: £ sterling ☐$_1$ Irish punts ☐$_2$ Other ☐$_3$ Please specify...............

☐$_{32}$

Less than 5000	☐$_1$	5000-10,000	☐$_2$	10,000-15,000	☐$_3$
15,000-20,000	☐$_4$	20,000-25,000	☐$_5$	25,000- 40,000	☐$_6$
More than 40,000	☐$_7$				

☐$_{33}$

Question 33
At what age did you (or will you) finish full time education?   ....years

34 ☐☐ 35

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If you have any queries about this research or would like to make any comments please use the space below.

If you would be willing to participate further in this research by completing either a postal or telephone survey please fill in your name and address below. Your help will be very much appreciated. Please remember all replies are treated confidentially and that it will not be possible to identify individuals in any report.

Name:..

Address:...

....

....

Postcode:.....................................

'Phone number:..

Please address any queries to: Sheelagh Matear,
Department of Shipping and Transport,
Institute of Marine Studies,
Polytechnic South West,
Plymouth,
Devon.
England. PL 4 8AA

Thank-you for answering this questionnaire.

Appendix F

Questionnaire for Freight Shippers

Questionnaire ref.no_____

₁ □□□ ₄

[1]₅

Dear Sir or Madam,

I am a postgraduate researcher at Polytechnic South West in Plymouth, currently studying the purchasing of freight transport services between Great Britain and Ireland.

I would like to ask you to help with this study by completing this questionnaire. The questionnaire is quick and simple to answer and all the replies will be **completely confidential.** Your help will be greatly appreciated.

Thank you for your co-operation.

Sheelagh Matear.

All the following questions concern surface or air freight transport services between Great Britain and Ireland (both The Republic of Ireland and Northern Ireland). This includes goods being transhipped to or from continental or deep sea services. Please answer the questions on **both** sides of each page.

Question 1

Does your company send or receive goods by either surface or air transport?

GB → Ireland	Yes	□₁	No	□₂
Ireland → GB	Yes	□₁	No	□₂

□₆

□₇

Question 2

Who selects the sea or air service by which the goods are sent?

	Your company	Your trading partner	Someone else please specify
GB → Ireland by Sea	□₁	□₂	□₃ ....
Ireland → GB by Sea	□₁	□₂	□₃ ....
GB → Ireland by Air	□₁	□₂	□₃ ....
Ireland → GB by Air	□₁	□₂	□₃ ....

8 □□ 10
11 □□ 13
14 □□ 16
17 □□ 19

Question 3

Who pays for sea or air freight transport services?

	Your company	Your trading partner	Someone else please specify
GB → Ireland by Sea	□₁	□₂	□₃ ....
Ireland → GB by Sea	□₁	□₂	□₃ ....
GB → Ireland by Air	□₁	□₂	□₃ ....
Ireland → GB by Air	□₁	□₂	□₃ ....

20 □□ 22
23 □□ 25
26 □□ 28
29 □□ 31

Questions 4 to 13 are about your consignments and the freight transport services you use.

Question 4
Please indicate approximately what percentage of your trade between Great Britain and Ireland moves in each direction (i.e. combined = 100%).

GB → Ireland .... %   Ireland → GB .... %

32 ☐☐☐☐☐ 37

If you only have consignments which move **from GB to Ireland** please answer the set of questions on the **left.**
If you only have consignments which move **from Ireland to GB** please answer the set of questions on the **right.**
If you have consignments in **both directions** please answer **both left and right** sets of questions.

GB → Ireland	Ireland → GB

Question 5
What products are in your consignments?

....
....
....
....

Question 5
What products are in your consignments?

....
....
....
....

(wb) (eb)
38 ☐☐ 41
42 ☐☐ 45
46 ☐☐ 49
50 ☐☐ 53

Question 6
Do your consigments require any special care or treatment during transit (e.g. refrigeration).
Yes ☐$_1$ No ☐$_2$
If yes, what are the requirements?

....
....

Question 6
Do your consigments require any special care or treatment during transit (e.g. refrigeration).
Yes ☐$_1$ No ☐$_2$
If yes, what are the requirements?

....
....

54 ☐☐ 55
(wb) (eb)
56 ☐☐ 59
60 ☐☐ 63

GB → Ireland

Question 7
Do your products require special
monitoring for on-time delivery?
    Yes ☐₁   No ☐₂
If yes, what are the requirements?
(eg., proof of delivery)

....
....

Question 8
During certain months of the year
do you handle significantly more or
less consignments of your products.
    Yes ☐₁   No ☐₂
If yes, During which months do you
handle: More?...............................
           Less?...............................

Question 9
Where are the origin and destination
of your major product?
Nearest town to origin.........................
Nearest town to
destination   ....

Question 10
What are the typical or average size
of your consignments?
    ....tonnes/kg*   *delete as
                            appropriate
    ....cubic metres

Ireland → GB

Question 7
Do your products require special
monitoring for on-time delivery?
    Yes ☐₁   No ☐₂
If yes, what are the requirements?
(eg., proof of delivery)

....
....

Question 8
During certain months of the year
do you handle significantly more or
less consignments of your products.
    Yes ☐₁   No ☐₂
If yes, During which months do you
handle: More?...............................
           Less?...............................

Question 9
Where are the origin and destination
of your major product?
Nearest town to origin.....................
Nearest town to
destination   ....

Question 10
What are the typical or average size
of your consignments?
    ....tonnes/kg*   *delete as
                            appropriate
    ....cubic metres

(wb orig)
(wb dest)
(eb orig)
(eb dest)

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GB → Ireland

Question 11

Which of the following transport systems do you use for your consignments. If you tick more than one option, please indicate approximately what percentage of your total consignments goes by each option.

%

Full road container and sea □₁ ....
Full rail container and sea □₂ ....
Full road trailer and sea □₃ ....
Part load by rail and sea □₄ ....
Part load by road and sea □₅ ....
Other sea □₆ ....
   please specify...........................
Express services □₇ ....
Full air container □₈ ....
Consolidated air service □₉ ....
Other air □₁₀ ....
   please specify...........................

Question 12

Please specify the routes which your consignments use?

Seaport(s) in GB   Seaport(s) in Ireland
....
....

Leave choice of port to carrier □

Airport(s) in GB   Airport(s) in Ireland
....
....

Leave choice of airport to carrier □

Ireland → GB

Question 11

Which of the following transport systems do you use for your consignments. If you tick more than the options, please indicate approximately what percentage of your total consignments goes by each option.

%

Full road container and sea □₁ ....
Full rail container and sea □₂ ....
Full road trailer and sea □₃ ....
Part load by rail and sea □₄ ....
Part load by road and sea □₅ ....
Other sea □₆ ....
   please specify...........................
Express services □₇ ....
Full air container □₈ ....
Consolidated air service □₉ ....
Other air □₁₀ ....
   please specify...........................

Question 12

Please specify the routes which your consignments use?

Seaport(s) in GB   Seaport(s) in Ireland
....
....

Leave choice of port to carrier □

Airport(s) in GB   Airport(s) in Ireland
....
....

Leave choice of airport to carrier □

Please answer all the remaining questions.

Question 13

Do you operate your own road vehicles between GB and Ireland?

Yes □₁   No □₂

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Question 14

How frequent are your consignments?

		daily	2-4 a week	weekly	monthly	less than monthly	never	
GB → Ireland	surface	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 39
Ireland → GB	surface	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 40
GB → Ireland	air	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 41
Ireland → GB	air	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 42

Question 15

When you are considering which transport service to use, how would you rate the following points. Please ring the number on the scale of 1 to 5. A score of 1 indicates that the point is extremely unimportant while a score of 5 indicates that you feel that particular point to be of vital importance.

	extremely unimportant				extremely important	
(1) High frequency of transport service	1	2	3	4	5	☐ 43
(2) On-time collection and delivery	1	2	3	4	5	☐ 44
(3) Short transit time for goods	1	2	3	4	5	☐ 45
(4) Knowing which port/airport is used	1	2	3	4	5	☐ 46
(5) Proximity of port/airport to origin of goods	1	2	3	4	5	☐ 47
(6.) Proximity of port/airport to destination of goods	1	2	3	4	5	☐ 48
(7) Departure time of day of goods from origin.	1	2	3	4	5	☐ 49
(8) Arrival time of day of goods at destination	1	2	3	4	5	☐ 50
(9) Transport preference of trading partner	1	2	3	4	5	☐ 51
(10) Low price of transport	1	2	3	4	5	☐ 52
(11) Value for money price of transport	1	2	3	4	5	☐ 53
(12) Special offers or discounts for transport	1	2	3	4	5	☐ 54
(13) Good relationship with carrier	1	2	3	4	5	☐ 55
(14) Avoidance of loss, damage or theft	1	2	3	4	5	☐ 56
(15) Documentation completed by carrier rather than by shipper or consignee	1	2	3	4	5	☐ 57
(16) Fast response by carrier to any problems	1	2	3	4	5	☐ 58
(17) Capacity of carrier to handle shipments with special requirements	1	2	3	4	5	☐ 59
(18) Ability of carrier to perform unanticipated urgent deliveries	1	2	3	4	5	☐ 60

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Question 16
Are there any other points you feel to be important when purchasing GB Ireland freight services. If so what are these points and what score would you give them on the above scale? ....
....
....

Question 17
Which point, including any you may have added, do you feel to be the single most important in the purchase of these freight services?
....

Question 18
Which single point do you consider to be the next most important?
....

Question 19
Which single point is the least important?
....

Question 20
What is your personal involvement in making the decisions to purchase GB/Ireland freight transport services?

Major decision maker ☐₁   Involved but not major decision maker ☐₂   Not involved ☐₃

Question 21
What is your department called? ....
....

Question 22
What is your job title?..

Question 23
What are the job titles of other people (if any) involved in purchasing GB/Ireland freight transport services? ....
....
....
....

Question 24
What is the nearest town to where you work? ....

Question 25
Approximately how many people does your company employ?

...... at this location   ...... in total

Question 26
Approximately, what was the annual turnover of your company last year?

....

Question 27
How long have you held your present position with this company?
.............years

If you would be willing to participate further in this research and would like a copy of the general results please give your name, address and telephone number.
Your Name:
Job title:
Company Name:
Address:

☎

Please add below any comments or queries about the questionnaire or the overall research below. **Please note that the survey is completely confidential and it will not be possible to identify individual companies or persons in any report.**

Please return the questionnaire in the enclosed postage paid envelope.

Thank you for answering this questionnaire

Please address any queries to: Sheelagh Matear,
Dept. Shipping and Transport,
Institute of Marine Studies,
Polytechnic South West,
Drake Circus,   ☎ 0752 232436
Plymouth. PL4 8AA   Fax. 0752 232293

Appendix G

Questionnaire for Freight Agents

POLYTECHNIC SOUTH WEST

Plymouth

Questionnaire ref. no. _____

Dear Sir or Madam,

I am a postgraduate researcher at Polytechnic South West in Plymouth, currently studying the purchasing of freight transport services between Great Britain and Ireland.

I would like to ask you to help with this study by completing this questionnaire. The questionnaire is quick and simple to answer and all the replies will be **completely confidential.** Your help will be greatly appreciated.

Thank you for your co-operation.

Sheelagh Matear.

All the following questions concern surface or air freight transport services between Great Britain and Ireland (both The Republic of Ireland and Northern Ireland). This includes goods being transhipped to or from continental or deep sea services. Please answer the questions on **both** sides of each page.

Question 1
Does your company <u>arrange</u> transport but <u>not</u> actually carry goods between Ireland and Great Britain?

Yes ☐$_1$ No ☐$_2$

Question 2
Does your company <u>actually carry</u> goods between Ireland and Great Britain?

Yes ☐$_1$ No ☐$_2$

Question 3
How would you classify your company?

Freight forwarder ☐$_1$

International Carrier ☐$_2$

Other ☐$_3$ please specify ....

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Question 4

What transport services does your company arrange or operate between Ireland and Great Britain?

Door to door full load accompanied trailer ☐₁
Door to door full load unaccompanied trailer ☐₂
Express delivery ☐₃
Groupage by surface modes ☐₄
Air consolidation ☐₅
Documentation and customs clearance ☐₆
Other, please specify ☐₇ ....

Question 5

Apart from Ireland, what other countries or areas does your company offer transport services to?

Western Europe ☐₁	Scandinavia ☐₂	Australia ☐₃
Eastern Europe ☐₄	North America ☐₅	Asia ☐₆
South America ☐₇	Worldwide ☐₈	

Question 6

Does your company have a distribution depot in Great Britain and/or Ireland?

Great Britain   Yes ☐₁   No ☐₂
Ireland   Yes ☐₁   No ☐₂

Question 7

How frequently does your company use a sea ferry or air GB ⟵⟶ Ireland transport service?

	daily	2-4 week	weekly	monthly	less than monthly	never
GB → Ireland sea	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆
Ireland → GB sea	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆
GB → Ireland air	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆
Ireland → GB air	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆

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Question 8

Please indicate what route(s) (in either direction) your company uses?

SEA

	usual route	some-times	never
Larne-Stranraer	☐	☐	☐
Larne-Cairnryan	☐	☐	☐
Larne-Fleetwood	☐	☐	☐
Belfast-Ardrossan	☐	☐	☐
Belfast-Liverpool	☐	☐	☐
Belfast-Heysham	☐	☐	☐
Warrenpoint-Heysham	☐	☐	☐
DunLaoghaire-Holyhead	☐	☐	☐
Dublin-Liverpool	☐	☐	☐
Dublin-Fleetwood	☐	☐	☐
Fishguard-Rosslare	☐	☐	☐
Pembroke-Rosslare	☐	☐	☐
Belfast-Ellesmere Port	☐	☐	☐
Belfast-Holyhead	☐	☐	☐
Belfast-Garston	☐	☐	☐
Dublin-Holyhead	☐	☐	☐
Other, please specify....................	☐	☐	☐

AIR

	usual route	some-times	never
Belfast-Manchester	☐	☐	☐
Belfast-Prestwick	☐	☐	☐
Belfast-Birmingham	☐	☐	☐
Belfast-Glasgow	☐	☐	☐
Belfast-Liverpool	☐	☐	☐
Belfast-London	☐	☐	☐
Dublin-Manchester	☐	☐	☐
Dublin-Prestwick	☐	☐	☐
Dublin-Birmingham	☐	☐	☐
Dublin-Glasgow	☐	☐	☐
Dublin-Liverpool	☐	☐	☐
Other, please specify.................	☐	☐	☐
Other, please specify.................	☐	☐	☐

Question 9

Do you operate your own road vehicles between GB and Ireland?

Yes ☐₁ please go to *question 10*
No ☐₂ please go to *question 11*

Question 10

What percentage of journeys are made empty?

	% empty
Great Britain → Ireland	......
Ireland → Great Britain	....

Question 11

What is the main product you carry or arrange transport for? for example, mainly agricultural produce.

....
....

Highly varied, no main product ☐

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Question 12

When you are considering which sea or air transport service to use for your consignments, how would you rate the following points on a scale of 1 to 5. A score of 5 indicates the point is of vital importance while a score of 1 indicates that the point is extremely <u>un</u>important.

If you operate a service which uses **sea** transport please **answer part (a)**
If you operate a service which uses **air** transport please **answer part (b)**
If you use **both air and sea** transport please **answer both (a) and (b)**

(a)   ___Sea transport service___

	extremely <u>unimportant</u>				extremely important
	1 ←	2	3	4	5 →
(1) High frequency of sea service	1	2	3	4	5
(2) Punctuality of sea service	1	2	3	4	5
(3) Short time taken for sea crossing	1	2	3	4	5
(4) Proximity of port to origin of goods	1	2	3	4	5
(5) Proximity of port to destination of goods	1	2	3	4	5
(6) Departure time of sea crossing	1	2	3	4	5
(7) Arrival time of sea crossing	1	2	3	4	5
(8) Transport preference of shipper	1	2	3	4	5
(9) Low freight rate	1	2	3	4	5
(10) Value for money freight rate	1	2	3	4	5
(11) Special offers or discounts for sea service	1	2	3	4	5
(12) Relationship with sea carrier	1	2	3	4	5
(13) Fast response to any problems	1	2	3	4	5
(14) Availability of freight space	1	2	3	4	5

23
24
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32
33
34
35
36

488

(b)   <u>*Air transport service*</u>

	extremely unimportant				extremely important
	$\longleftarrow$				$\longrightarrow$
(1) High frequency of air service	1	2	3	4	S
(2) Punctuality of air service	1	2	3	4	S
(3) Short time taken for flight	1	2	3	4	S
(4) Proximity of airport to origin of goods	1	2	3	4	S
(5) Proximity of airport to destination of goods	1	2	3	4	S
(6) Departure time of of day of flight	1	2	3	4	S
(7) Arrival time of flight	1	2	3	4	S
(8) Transport preference of shipper	1	2	3	4	S
(9) Low freight rate	1	2	3	4	S
(10) Value for money freight rate	1	2	3	4	S
(11) Special offers or discounts for air service	1	2	3	4	S
(12) Relationship with air carrier	1	2	3	4	S
(13) Fast response to any problems	1	2	3	4	S
(14) Availability of freight space	1	2	3	4	S

Question 13

Are there any other points you feel to be important when purchasing GB←→Ireland air or sea services. If so, what are these points, and what score would you give them on the scale in *question 12*?

SEA:..   AIR:...

....

....

Question 14

Which point, including any you may have added, do you feel to be the <u>single</u> <u>most</u> <u>important</u> in the purchase of these freight services?

SEA:..

AIR: ....

Question 15

Which <u>single</u> point is the <u>next most</u> important?

SEA:..

AIR: ....

Question 16
Which <u>single</u> point is the <u>least</u> important?
SEA:..
AIR: ....

71 72
73 74

Question 17
What is your department called? ....
....

1   4
5 3 0 6
7   10

Question 18
What is your job title?...

11   14

Question 19
What are the job titles of the main other people (if any) involved in arranging or operating GB/Ireland freight transport services?
....
....
....

19   22
23   26
27   30

Question 20
What is the nearest town to where you work? ....

31   34

Question 21
Approximately how many people does your company employ?

...... at this location   ...... in total

35   38
39   42

Question 22
Approximately what was the annual turnover of your company last year?
....

43   46

Question 23
How long have you held your present position with this company?

...........years

47   48

If you would be willing to participate further in this research and would like a copy of the general results please give your name, address and telephone number.

Your Name:

Job title:

Name of Company:

Address:

☎

Please add any comments or queries about the questionnaire or the overall research below. **Please note that the survey is <u>completely</u> <u>confidential</u> and it will not be possible to identify individual companies or persons in any report.**

Please return the questionnaire in the enclosed postage paid envelope.

Thank you for answering this questionnaire

Please address any other queries to:

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Appendix H

Benefit segmentation in a transport market

Benefit segmentation in a transport market

Sheelagh Matear[*]   Dr. Richard Gray[†]   Professor Don Cowell[‡]

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1   Introduction

In the last thirty years segmentation has been recognised as a fundamental concept in the understanding of a market. The concept of segmentation however has seen relatively little application in the services sector and the transport industry is no exception.

This paper is concerned with a segmentation of the passenger market between Great Britain and Ireland (both Eire and Northern Ireland). Despite having played an important and innovative role in the development of short-sea ferry services worldwide (de Courcey Ireland, 1984) Irish sea shipping has been largely neglected as an area for study since the second world war.

The GB/Ireland passenger market is extremely competitive in both the sea and air sectors. The sea passenger sector also exhibits a high degree of seasonality (Rich and Matear, 1989). Three major sources of uncertainty confront the market in the medium term:

1. The impact of the Single European Market,

2. Deregulation of the European air industry,

3. The influence of the Channel tunnel on routes and services with perhaps operators and/or vessels being displaced from the English Channel.

This scenario emphasises the need for operators to optimise their market strategies now so as to be well placed to take advantage of market opportunities or to defend their market share in the future.

The present study undertakes a benefit segmentation of the sea and air markets with the aim of developing a model which may be used by operators in the formulation of marketing strategies.

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2 Data collection

Extensive data collection involving over 5000 passengers took place between August '89 and June '90. Surveys were conducted on board ferries on the Fishguard-Rosslare, Holyhead-DunLaoghaire and Larne-Stranraer routes and at Belfast City Airport, Belfast International airport and Dublin airport. Four surveys, at three monthly intervals were conducted on each ferry route and at each airport. This paper examines the the construction and profiling of benefit segments within a particular subset of the data foot passengers on the Larne Stranraer route.

Four sets of data were collected for each respondent:

1. Information regarding benefits sought,

2. Information regarding present and past travel behaviour with respect to journeys between GB and Ireland.

3. Information regarding passenger service buying behaviour for the current journey

4. Demographic and socio-economic characteristics of passengers.

Passengers were asked to assess the importance of 28 different aspects of the ferry service in determining their choice of service. A 5 point itemised rating scale was used with a score of 1 indicating that aspect to be very unimportant and 5 indicating that aspect was very important. A benefit profile could be constructed for each passenger according to the rating given to different aspects of the service.

The mean scores on service aspects for foot passengers on the Larne Stranraer route are presented in figure 1.

3 Analysis

The analysis of the data is a three stage process:

- **Stage 1 - Data reduction** The 28 aspects of the service are reduced, using principal components analysis, to 7 components.

- **Stage 2 - Segment construction** The responents are clustered on their principal component scores into 6 groups which form benefit segments.

- **Stage 3 - Segment profiling** This stage is concerned with profiling the benefit segments in terms of travel behaviour, buying behaviour and socio-demographic characteristics. Crosstabulations are performed to identify areas of difference between the benefit segments.
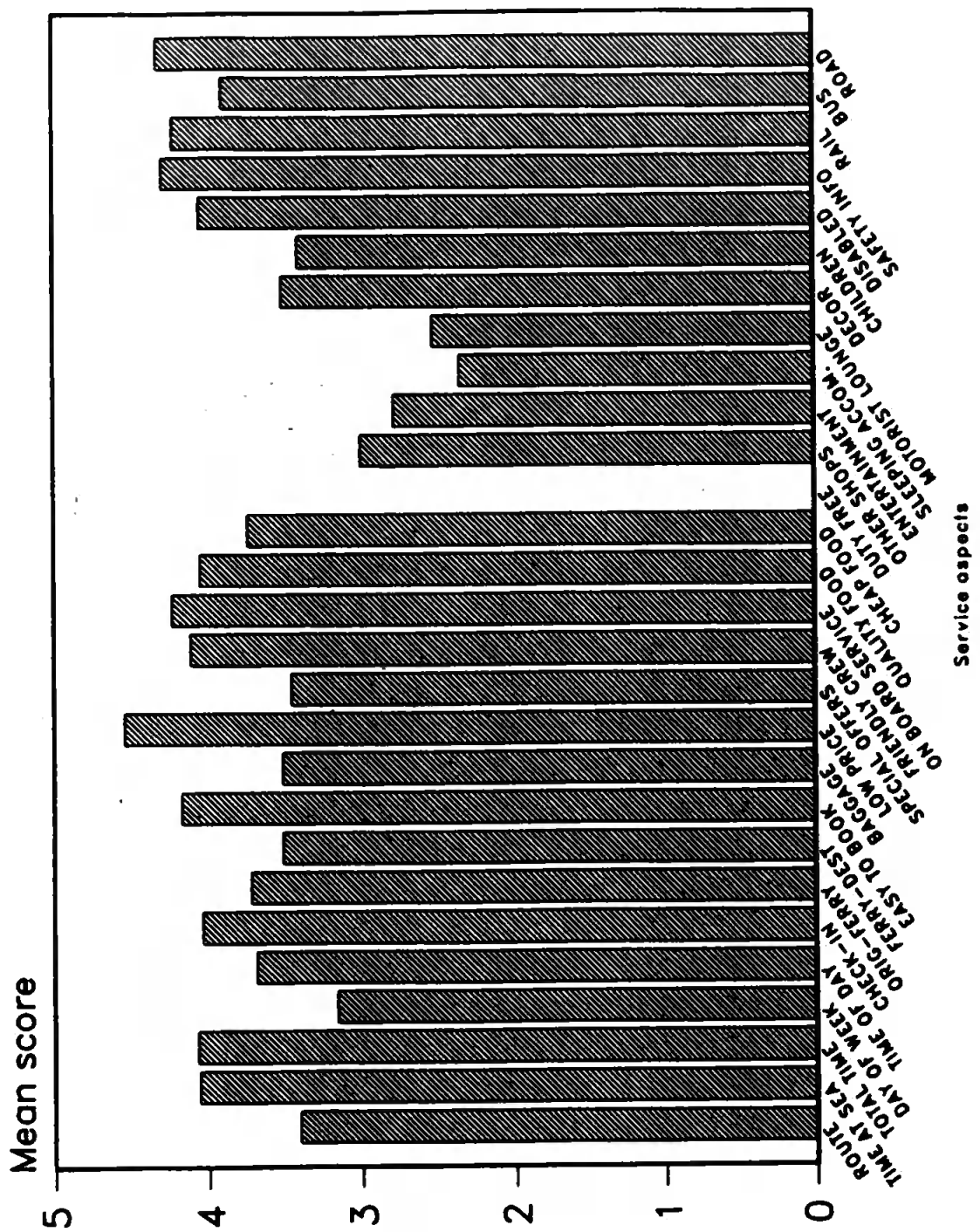
Figure 1: Mean scores on service aspects: Larne Stranraer Foot Passengers

3.1 Data reduction

Principal components analysis is employed in this analysis for 4 reasons.

1. Removal of redundancy from the data. Sheth (1971) states:

2. To identify the key components important in choice of service. Thus the components developed are interesting in themselves as they provide a structure for the data in addition to serving as a means of data reduction.

3. Removal of colinearity in the data.

4. To obtain factor scores for use in further analysis.

Kaiser's criterion is used to determine the number of components to be retained in the solution. Therefore components with eigenvalues greater than or equal to 1 are extracted.

In all data sets the principal components solution was rotated using a varimax rotation in order to simplify the factors. Service apects which have a factor loading of more than 0.5 on a component are considered to be important in its construction.

Principal components analysis of this data set produced 7 factors which accounted for 59.3% of the variance. The factors, following rotation are presented in table 1. Although low price appears to be the most important service aspect it should be noted that a price factor does not emerge from the principal components analysis. PC_2 'on board service at a reasonable' price is the only factor to contain a cost element.

3.2 Segment construction

A partitioning algorithm was used to cluster respondents into 6 groups. One advantage of a partitioning clustering method as opposed to hierarchial methods is that respondents are not irrevocably allocated to a group. Therefore reallocation of cases which may have incorrectly classified at an earlier stage is possible. Groups or clusters with 10 or more members are retained for profiling. The resultant clusters, based on similarity in principal component scores, form the benefit segments. Figure 2 shows the relative sizes of the benefit segments.

The mean factor scores were calculated for each of the benefit segments and are presented in table 2. Whether or not a particular factor is important or unimportant to a segment is determined by the sign of the mean factor score; a positive mean factor score is taken to mean that a factor is 'important' while a negative mean factor score indicates the factor to be unimportant. The degree to which the factor is unimportant or important is given by the magnitude of the mean factor score.

The mean factor score table is difficult to interpret. An alternative means of presenting this data is to plot it on an umbrella diagram. Umbrella diagrams provide a 2 dimensional interpretation of the dimensions of the

Table 1: Principal components for Larne Stranraer Foot Passengers

Principal component	service aspects loading >0.5	Components named
PC$_1$	Motorist fares, friendly attitude, Motorist lounge Decor, Facilities for children and disabled, safety	Minority group facilities
PC$_2$	Friendly attitude, good service and good food, cheap food	On board service at a reasonable price
PC$_3$	Check-in time required, Distance to and from origin and destination	Access time
PC$_4$	On board shops, Entertainment, sleeping accomodation	On board facilities
PC$_5$	Rail and Bus connections	Public transport
PC$_6$	Crossing and total travel time	Travel time
PC$_7$	Time and day of departure	Schedule

Table 2: Mean factor scores for clusters: Larne Stranraer Foot Passengers. Numbers in clusters are given in brackets.

Factor	Cluster 1 (41)	Cluster 2 (75)	Cluster 3 (33)	Cluster 4 (145)	Cluster 5 (51)	Cluster 6 (76)
Minority groups	-0.842	0.447	0.542	0.407	-0.173	-1.207
On board service	0.949	0.149	-0.108	0.183	-0.161	-0.981
Access time	0.531	0.766	-0.918	0.042	-1.352	0.068
On board facs.	-0.265	0.139	-0.445	0.291	-0.217	0.127
Public transport	-0.938	-0.112	-1.556	0.483	0.455	0.231
Travel time	-0.958	-0.151	1.081	0.295	-0.913	0.340
Schedule	0.439	-0.964	-0.111	0.461	-0.348	0.077

principal components in the clusters. Each component is represented by a spoke or radius of the diagram. Each spoke is scaled from -2.0 to +2.0, with zero being the mid point. When all the 0 points on the spokes are joined into a polygon (dotted line) this represents the universal set (as the components have a standard normal distribution). This universal set is the base against which the clusters or segments are compared. By plotting the mean factor scores for the components for each cluster it may be more easily seen which components are important to a particular segment and which are less important. The umbrella diagrams for the clusters are presented in fig 3.

The segments have been labelled (see table 3) on the basis of the importance or lack of importance which they have attached to various factors. The segments developed here are dominated by public transport connections. Only 1 segment ('convenience') does not include public transport as either important or unimportant.

3.3 Profiling benefit segments

Crosstabulations are performed to detect which variables (taken from travel behaviour, buying behaviour and demographic and socio-economic characteristics) differ significantly between all the segments. The χ^2 statistic is used to determine whether a relationship exists between the independent, or profiling, variable and segment membership. Differences which are significant at the 0.05 confidence level are discussed.

The variables which differed significantly at the 0.05 level according to a χ^2 test are as follows:

- Purpose of travel

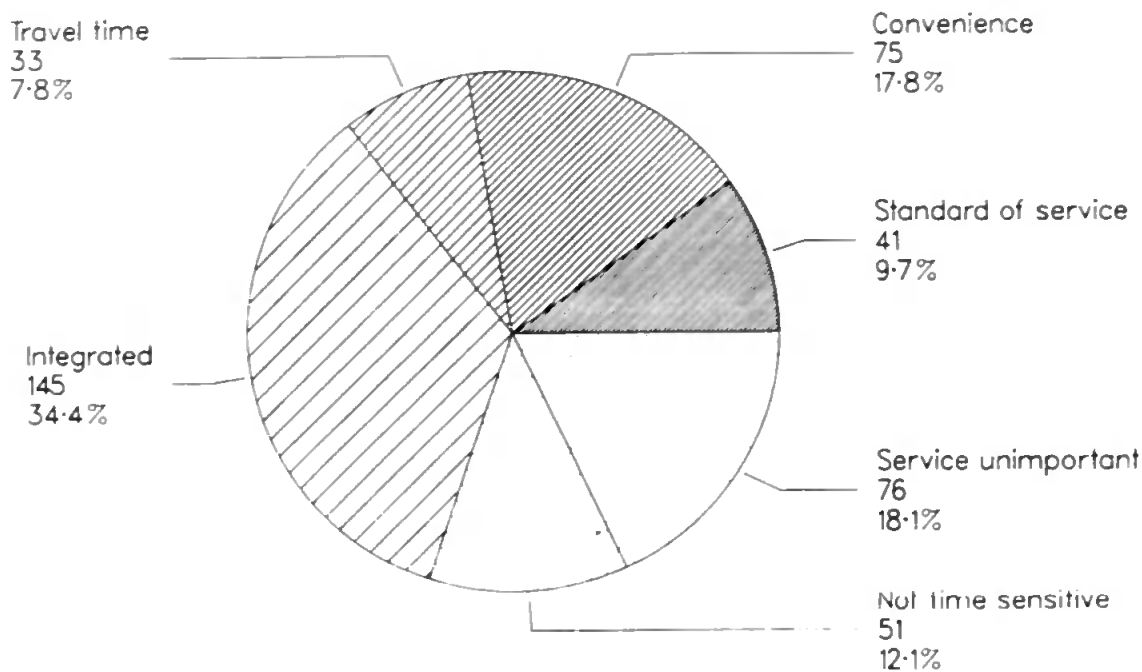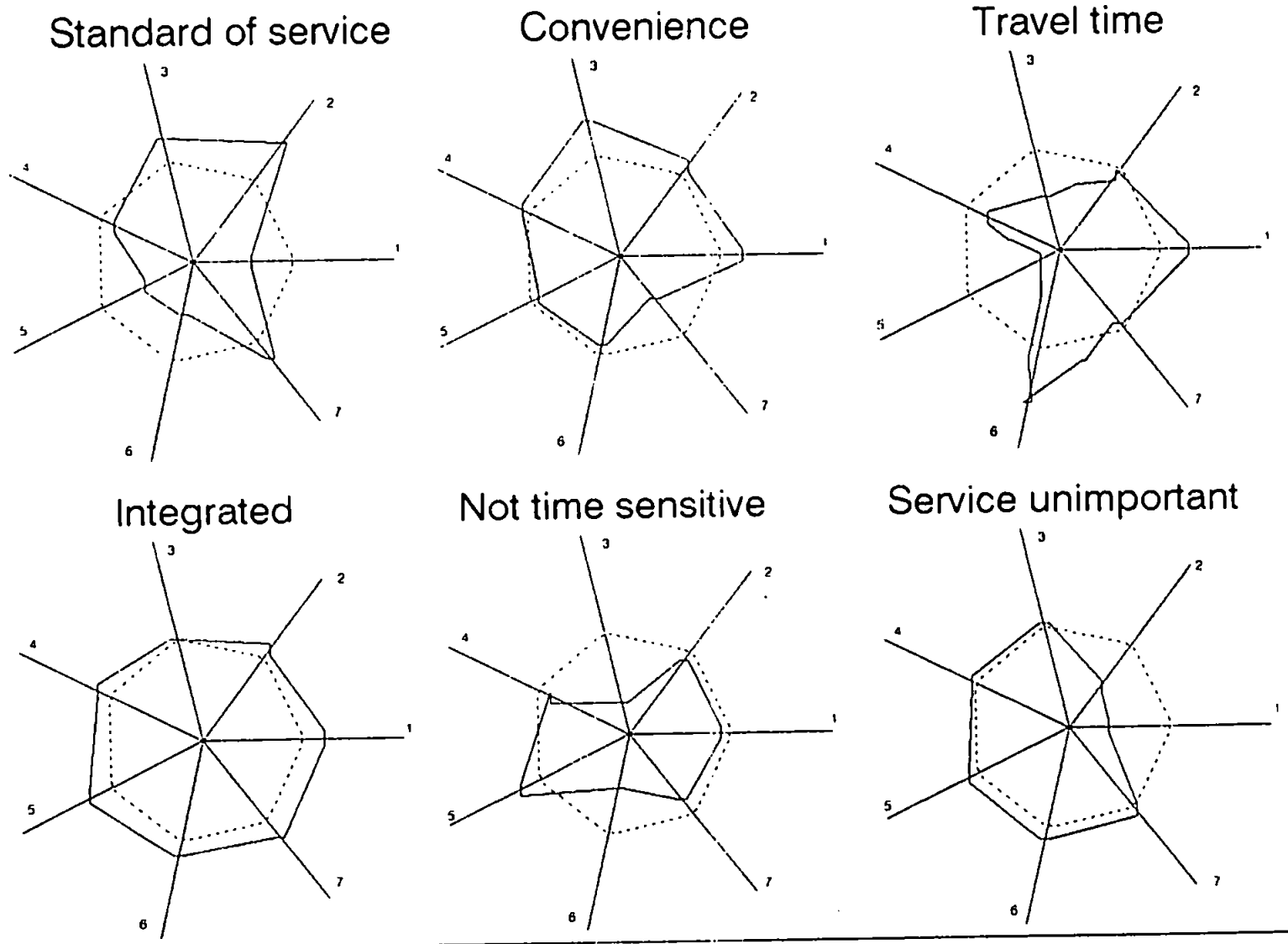- Who the passenger is travelling with

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Figure 2: Relative sizes of Larne Stranraer Foot passengers

Table 3: Benefit segment labels: Larne Stranraer Foot Passengers

Segment no. and size of segment	Important factors	Unimportant factors	Segment label
1 (41)	On board service at a reasonable price Schedule, minority facs.	Travel time Public transport	Standard of service
2 (75)	Access time Environment / minority facs	Schedule Travel time	Convenience
3 (33)	Travel time Environment / minority facs	Public transport Access time	Travel time
4 (145)	Public transport Schedule		Integrated
5 (51)	Public transport	Travel time Access time	Not time sensitive
6 (76)	Travel time Public transport	Envir./minority On board service	Service unimportant

Figure 3: Larne Stranraer Foot passengers. Umbrella diagrams

Standard of service

Convenience

Travel time

Integrated

Not time sensitive

Service unimportant

Key
1: Minority groups
2: On board service
3: Access time
4: On board facilities
5: Public transport
6: Travel time
7: Schedule

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Table 4: Profile of the 'standard of service' segment, Larne Stranraer Foot Passengers

54% on holiday/visit to friends and relatives
38% travel with friends
34% travel with one other person
19% travel in groups of more than 5 persons
44% aged between 15 and 24
76% are male
37% arrive at the port by rail
37% continue their journey by rail
62% are single

- The number of passengers in the group

- Age

- Sex

- Marital status

- Means of arriving at the port

- Means of continuing the journey from the port.

Profiles of 2 of the segments will be considered in detail.

The standard of service segment The 'standard of service' segment contains a higher proportion of passengers travelling for holiday visiting friends and relatives than expected. This segment has the highest proportions of passengers who were travelling with friends. In conjunction with this, a relatively high proportion travelled with one other person. There are also higher than expected proportions travelling in groups of 5 persons or in groups of more than 10 persons. This segment appears to have a young age profile with a higher than expected proportion of passengers aged between 15 and 24. This 'standard of service' segment contains the highest proportion of male passengers and more single passengers than expected. A higher than expected proportion of passengers use rail both to arrive at the port and also to continue their journey.

The Convenience segment The 'convenience' segment (see table 5) has the highest proportion of passengers who were on holiday only and also a higher proportion of business passengers than expected. It has the highest proportion of passengers who were travelling with their family. This segment was the least likely to be travelling alone with higher than expected proportions in all group sizes except for groups of five persons. It has a slightly

501

Table 5: Profile of the 'convenience' segment, Larne Stranraer Foot Passengers

23% on holiday only
19% travel for business
41% travel with their family
15% are aged over 55
56% are female
39% arrive at the port by bus
31% continue their journey by bus

older age profile with higher than expected proportions of passengers aged between 55-64 and over 64. This segment has the highest proportion of female passengers. It has the highest proportion of passengers who arrived at the port by bus and also passengers who continued their journey by bus.

4   Conclusion

Benefits required by foot passengers for a short sea ferry service were developed, using principal components analysis, from an extensive list of aspects of the service. Passengers were clustered into benefit segments on the basis of factor scores on the components. The umbrella diagrams provide an alternative method of identifying benefits required by the segments. By matching the shape of the segments to the service it may be possible to indicate areas where the company may be over-, or more importantly, under-performing. Benefit segments exist within the market and can be profiled in terms of travel behaviour, buying behaviour and demographic and socio-economic characteristics. This benefit segmentation of the market may be used to form the basis for a marketing strategy.

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