

Retail Spending and Store Location during a Recession: An Analysis of Changing Consumer Behaviour and Interaction Patterns

by

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The candidate confirms that the work submitted is his/her own, except where work which has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

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Part of the work in Chapter 6 is based on the joint publication:

Thompson, C., Stillwell, J. and Clarke, M. (2010a). 'The changing grocery market in Yorkshire and Humber', *The Yorkshire and Humber Regional Review*, 20 (4): 12-14.

All analysis and work was conducted by Chris Thompson. Contributions from John Stillwell and Martin Clarke were purely editorial and advisory.

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Abstract

Since falling into recession in June 2008, the British economy has been in a state of sustained instability. During this period, Great Britain (GB) has experienced high rates of inflation, increasing unemployment and widespread consumer uncertainty. It has become clear that new shopper ground rules have emerged, as consumers have begun to break from their established routines, seeking both quality and value for money. This has been no more evident than in the British grocery market, the lead sector of the retail industry, as consumers have been forced to evaluate all aspects of the household budget, including essential items such as food. In addition to the macro-economic pressures, the grocery sector is also being shaped by long-term structural trends that continue to drive the retail industry as a whole. Those of noticeable importance are the changing nature of the British high street, online retailing, growth in convenience shopping, market saturation and increasing internationalisation. Consequently, to understand change in grocery retailing, geographers need to move away from a one-dimensional account of the recession and consider the conflicting perspectives of governments, regulators, retailers and consumers that are also at work.

This thesis contributes to ongoing research aimed at quantifying the impact of the recent recession on the British grocery market. The research benefits from a collaboration with Acxiom Ltd, through the use of a large-scale household survey aimed at recording local patterns in consumer behaviour across GB. To provide a holistic approach, insights into supply-side trends (changing retail formats, market saturation, e-commerce and internationalisation) are explored in conjunction with issues of demand (changes in household expenditure and customer patronage) – making it possible to separate recessionary trends from those deemed more longstanding. The complexities underpinning grocery retailing are then integrated through the construction of a disaggregated Spatial Interaction Model (SIM) to facilitate opportunities for growth in the grocery market. The disaggregation of the SIM by consumer type affords tremendous potential for the model to incorporate flows between different households and retail brands – recognising that some households are more willing or able to travel further to shop at their retailer of choice. The thesis demonstrates how the SIM is utilised to investigate growth opportunities in the discount market, highlighting the potential for expansion in both already saturated (Yorkshire and the Humber) and previously untapped markets (London) respectively.

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Glossary of Terms

AD	Aggregate Data
AED	Absolute Entropy Difference
APE	Acxiom Population Estimates
ABI	Annual Business Inquiry
APS	Annual Population Survey
APC	Average Propensity to Consume
BHPS	British Households Panel Survey
B2B	Business to Business
CAS	Census Area Statistic
COICOP	Classification Of Individual CONsumption by Purpose
CC	Competition Commission
CPI	Consumer Price Index
DWP	Department for Work and Pension
DOE	Department of the Environment
EFTPS	Electronic Financial Transfer at Point of Sale
EPOS	Electronic Point of Sale
EHCS	English House Condition Survey
EHS	English Housing Survey
EFS	Expenditure Food survey
FHLMC	Federal Home Loan Mortgage Corporation
FNMA	Federal National Mortgage Association
FTP	File Transfer Protocol
FAO	Food and Agricultural Organisation
FES	Food Expenditure Survey
GRO	General Register Office
GIS	Geographical Information Systems
GFK	Gesellschaft fur Konsumforschung's
GOR	Government Office Region
GB	Great Britain
HHFCE	HouseHold Final Consumption Expenditure
HRP	Household Reference Person
HIS	Integrated Household Survey
IDBR	Inter-Departmental Business Register
IMF	International Monetary Fund
IPCC	International Panel on Climate Change
JSA	Jobseekers Allowance
LFS	Labour Force Survey
LCF	Living Cost Food Survey
LAD	Local Authority District
LSOA	Lower Super Output Areas
MPC	Marginal Propensity to Consume
MTD	Mean Trip Distance
MSOA	Middle Layer Super Output Area
MYE	Mid-Year Estimates

MMC	Monopolies and Mergers Commission
MEDC	More Economically Developed
NFS	National Food Survey
NSPD	National Statistics Postcode Directory
ONS	Office National Statistics
OFT	Office of Fair Trade
OFT	Office of Fair Trading
OMR	Optical Mark Recognition
ORD	Originates and Distribution Model
OA	Output Area
OAC	Output Area Classification
PAYE	Pay-As-You-Earn
PPG	Planning Policy Guidance
RPM	Resale Price Maintenance
ROP	Research Opinion Poll
RPI	Retail Price Index
RSI	Retail Sales Inquiry
RBS	Royal Bank of Scotland
SAM	Small Area Microdata
SIM	Spatial Interaction Model
SIC	Standard Industrial Classification
SRMSE	Standardised Root Mean Squared Error
SOA	Super Output Areas
SHE	Survey for English Housing
BRES	Business Register and Employment Survey
BRS	Business Register Survey
GLF	General Lifestyle Survey
TBB	Theory of Buyer Behaviour
UKSA	UK Statistics Authority
UA	Unitary Authorities
UK	United Kingdom
VAT	Value Added Tax
VBA	Visual Basic for Applications

Chapter 1

Introduction

1.1 Setting the Scene

From the third quarter of 1992 until the first quarter of 2008, the British economy went through a period of sustained economic growth, spanning a record breaking 16 years. For almost two decades, the country witnessed and many people reaped the rewards of increasing levels of employment, disposable income, easily accessible credit and rocketing house prices (Donnan, 2009). However, through a remarkable turn of events, on the back of a collapse in the United States (US) housing market, Great Britain (GB) became affected by one of the most severe global financial crises in history. Taking nearly all commentators by surprise, by the end of the third quarter in 2008, the British economy was officially declared to be in a recession. The Office for National Statistics (ONS) announced that Gross Domestic Product (GDP) showed a fall of 1.8 per cent after a 0.5 per cent drop in the previous quarter (ONS, 2012a). This contraction represented the biggest quarter-on-quarter decline since 1980, and the first time the economy had been in recession since 1990-93. Despite the prediction of a sharp recovery, the economy continued to decline for an entire year (Edward and Irwin, 2012). Nevertheless, even with a brief period of recovery and drastic intervention by the British Government, the country once again found itself in recession in 2012, signalling two quarters of negative growth and the first double-dip recession since 1975 (Campos *et al.*, 2011), leading to some commentators describing this challenging period as the most severe recession in British history (Chari *et al.*, 2008; Gregg and Wadsworth, 2010; Chadha and Warren, 2012).

Since 2008, GB has been in a state of sustained economic fragility; the recession and faltering recoveries have become associated with high rates of inflation, record levels of unemployment (Martin, 2011; Hutton and Lee, 2012), plummeting house prices (Radice, 2008), an evaporation of credit and increasing consumer uncertainty (Gregg and Wadsworth, 2010). The pressures of the economic slowdown have forced people to alter their behaviour, as consumers are now actively searching for ways to reduce household expenditure (Hardie, 2009; Reuben, 2009; Thompson *et al.*, 2012). It has become clear that new shopper ground rules have emerged, as consumers have begun to break from their established routines, seeking a mixture of quality, value and values. To add further complexity, the documented effects on consumers and retailers have not been evenly distributed. Consumers are behaving differently depending on their

demographic and socioeconomic characteristics (Gritten, 2011; Thompson *et al.*, 2010a). Some commentators have even hypothesised that the modification in behaviour could in fact lead to a fundamental shift in the economic geography of GB by reducing the country's north-south divide (Vaitilingam, 2009; Lee, 2012). For instance, regions such as London continue to prosper whilst high streets in many northern regions have fallen into considerable decline, synonymous with increasing vacancy rates.

The influence of the recession has been no more evident than in the British grocery market, as consumers have even been forced to evaluate essential items of the household budget. Regarded as the lead sector of the retail industry (Wrigley and Lowe, 2002), on account of the profound influence that the grocery market has on society (accounting for 55p of every £1 of retail spend (IGD, 2013)), it stands out as a key sector on which to quantify the major effects of the recession and the emerging trends (Thompson *et al.*, 2012; Wrigley and Dolega, 2011). In what has been a historically oligopolistic environment (Burt and Sparks, 2003), controlled by the 'big four' (Tesco, Asda, Sainsbury's and Morrisons), the fallout from the recession has created favourable trading conditions for a number of other retailers to regain market share. Similarly to the period which followed the 1990-93 recession, the market has become polarised, leading to unprecedented growth in the discount market (with brands such as Aldi, Lidl and the former Netto) and for premium retailers such as Waitrose (Hardie, 2013). Nonetheless, in addition to the obvious economic pressures, the grocery sector is also being shaped by a backdrop of structural trends that continue to drive the retail industry. Those of noticeable importance are considered to be changing the nature of the British high street (Wrigley and Dolega, 2011), the impact of online retailing (Wrigley and Dolega, 2011), growth in convenience shopping, market saturation and increasing internationalisation (Burt *et al.*, 2008). Consequently, geographers need to move away from a one-dimensional account of the retail industry and attempt to understand economic shocks in relation to the multi-dimensional and conflicting perspectives of governments, regulators, retailers and consumers (Wrigley and Lowe, 2002).

Even as the economy moves into a period of recovery, the future of retailing and specifically the grocery market is unclear. Some trends, both structural and recessionary, will stick, and some will fade. Attention will turn to how sustainable growth can be built at local, regional and national levels, and how the sector might meet the challenges and opportunities of the future. As a result, it is against the multitude of pressures that locational issues are taking on a greater significance (Birkin *et al.*, 2010), as retailers have no choice but to develop more sophisticated techniques to support their forthcoming expansion plans. However, this presents a challenge since retailing in Britain is complex and varied and thus can evade easy comprehension. Understanding what is happening now – how consumers are behaving, where and why the

patterns are occurring and how they are persisting, changing or will develop – is extremely important, and it is this context which frames the overall research aim of this thesis.

Nevertheless, whilst there remains a wealth of literature documenting the causes and development of the recession, the academic literature is lacking an up-to-date documentation of the (supply and demand) effects it has had on not only the grocery market, but retailing in general. This can partly be accredited to the lack of available data from official sources. The Economic and Social Research Council (ESRC) recognise this, and are strongly encouraging collaborative research with the private sector through a variety of funding schemes. Consequently, the research reported in this thesis has been undertaken through a partnership with Acxiom Ltd, a major retail consultancy firm within GB. The work has been funded and encouraged by the ESRC through the Retail Industry Business Engagement Network (RIBEN), which seeks to encourage and facilitate collaboration between academics and the retail industry. As part of the relationship, the thesis has directly benefited from access to valuable industry data sources, particularly the use of a large-scale household survey aimed at recording local patterns in consumer behaviour across GB. Nonetheless, the focus remains explicitly academic and was not driven by the needs of Acxiom Ltd, whose input was only to provide the required data and offer informal discussion on issues of relevance to the project.

1.2 Research Aim, Questions and Objectives

The primary aim of this thesis is to quantify the impact of the recession on the British grocery market both from a consumer (demand side) and a retailer (supply side) perspective. However, before this can be done, you need to understand the causes and extent of the recession vis-à-vis previous recessions in connection with the range of factors that have determined the evolution of demand and supply in the grocery market. However, there is a dearth of data in this area, which means that it is necessary to look beyond official sources and seek benefits from private sector collaboration. Moreover, in order to capture the impact of recession, data and methods are required that focus on both demand and supply, the linkage between them and modelling methods that can be used to identify opportunities for development in the grocery sector. Consequently, the aim and the structure of the thesis are underpinned by a series of research questions as follows:

1. What were the primary causes and subsequent impacts of the recent recession and how do they compare against a history of recession in GB.
2. What are the contributing factors to the changing dynamics of the British grocery market?

3. What data can be used to provide an insight into the location strategies of retailers and the behaviour of consumers in the British grocery market since the beginning of the twenty-first century?
4. How and where have the main retailers in the British grocery market developed their store networks through a period of recession?
5. How have consumers (accounting for their demographic and socioeconomic characteristics) in the grocery market adjusted their behaviour (if at all) as a result of the recession?
6. What are the major underlying geographic trends to surface from the economic downturn in the grocery market?
7. Is there a more advanced Spatial Interaction Modelling (SIM) methodology suitable for predicting opportunities in the grocery sector during a period of recession?

These research questions can be restructured as thesis objectives and the chapters which contain research satisfying each of the objectives can be found in Table 1.1.

Table 1.1. Thesis objectives and corresponding chapters

Objective	Corresponding Chapter(s)
1. To review and gain a comprehensive understanding of the extensive literature surrounding the recession, long-term trends in the British grocery sector and the characteristics that drive consumer behaviour.	Chapters 2 and 3
2. To undertake an assessment of the methodological techniques used for grocery expenditure estimation and low-level market share estimates.	Chapters 4, 6 and 7
3. To validate Acxiom's Research Opinion Poll (ROP) data against existing data sources concerning household expenditure and customer patronage.	Chapter 4, 7 and 8
4. To provide an up-to-date assessment of the major supply-side changes in the British grocery sector since the start of the 21 st Century.	Chapter 5
5. To illustrate the impact of the recession on consumer behaviour with regards to varying demographic, socioeconomic and low-level geographic characteristics.	Chapter 5 and 6
6. To build on existing methods and develop techniques for the estimation of grocery expenditure and spatial market share estimates.	Chapter 4, 6 and 7
7. To offer recommendations on potential growth opportunities in the British grocery market through utilising a disaggregated SIM	Chapter 8

1.3 Thesis Structure

Chapter 2 introduces the thesis and will immediately begin to address part of the first objective through a thorough review of recession in GB. Considerations are given to the origin and development of the most recent recession, exploring a number of contrasting theories, arguments and ideologies. The various impacts of this recession are also addressed through the context of the labour market, their geographical implications and the documented effects on retail consumers. On discussing the current recession in some detail, attention is directed toward

recessions of the past (post Second World War). This will allow the dynamics of the current economic downturn to be placed in a historical context and ensure that informed conclusions on its impacts can be made in succeeding chapters.

Chapter 3 completes the first objective of the thesis by addressing the second research question concerning non-recessionary trends in the grocery market. Whilst Chapter 2 will provide a detailed examination of the recession, it is important to place this in the context of the more long-term drivers of consumer expenditure (demand) and retail expansion (supply). Initially, attention will be given to specific theories of household consumption and the various demographic, socioeconomic and geographic drivers of expenditure – with particular attention focused upon the food retail market. The identification of the main drivers of expenditure will also provide an essential part in the selection of variables to be examined in Chapters 4 and 6. In conjunction, to provide a holistic examination of demand and supply, Chapter 3 will finish by also reflecting upon the key influences on, or barriers to, retail development and the structural changes that have occurred in the grocery market over the last 40 years.

Chapter 4 addresses the third objective through an examination of the available data to be used in the subsequent research. Specific attention will be given to the different study areas that will be explored, the available geographical data, data relating to the main retailers in the British grocery market and the data concerning household expenditure. The major contribution of this chapter will come through the verification and validation of a unique commercial data set, Acxiom's Research Opinion Poll (ROP). As private sector collaborations continue to be encouraged by the ESRC, it is essential that commercial data such as these are found to be fit for purpose if they are going to be used in academic research, particularly since much of the remaining thesis will make use of these data.

Chapter 5 provides a major contribution towards addressing the fourth and fifth objectives of this thesis. The chapter will reflect upon the performance of the food retail industry through the recent recession – providing a comparison against the wider economy. Thereafter, a detailed spatial analysis of household expenditure on groceries is provided, so to identify the geographic variations in spending and customer patronage. Specific attention will also be given to the role of e-commerce and the geographic patterns it presents. A detailed analysis of the supply-side changes in the grocery market since the start of the century will also be addressed, illustrating changes in store numbers, floorspace, store formats and distribution channels. Analysis will also be presented at the Local Authority (LAD) level in order to provide greater geographic detail than has hitherto been reported in the literature in recent years.

Chapter 6 reflects on several of the objectives regarding household behaviour through the course of the recession. Initially, household expenditure is examined across all areas of consumption so as to determine how households are managing their budgets. In addition, the chapter will also tackle the second objective by documenting the estimation of household grocery expenditure and the harmonisation of categorical time-series data over time. Following this, an examination will be undertaken of how consumers, disaggregated by a range of demographic, socioeconomic and geographic variables, have fared over the course of the recession in two comparative regions (Yorkshire and the Humber and London). The variables selected for analysis are those identified in the literature from Chapters 2 and 3 as having a significant impact on household grocery expenditure. The remainder of the chapter will then focus on customer patronage and the identification of ‘switching’ behaviour by certain households between retailers. New insights are also provided into the take-up and penetration of e-commerce as a viable channel in the grocery market.

Chapter 7 incorporates many of the findings in previous chapters (supply and demand) through the development of a disaggregated SIM to estimate the flow of households from specified origins to individual grocery outlets. A review of the literature surrounding the principles of SIMs is provided to address the second objective. The remainder of the chapter will then concentrate on the design and application of a disaggregated SIM using the 2001 Output Area Classification (OAC). Objective six is then addressed, by highlighting the contributions the model makes to the SIM literature and the performance of the model in terms of market share, customer profiles and store flows.

Chapter 8 utilises the SIM developed in Chapter 7 and in doing so addresses objective seven. A detailed process is provided for locating new Aldi stores in the British grocery market, a discount retailer with ambitious expansion plans for the future. Opportunities for growth are explored in two comparative regions to address issues of market saturation (Yorkshire and the Humber) and previously untapped markets (London). The chapter closes with a discussion of the performance of the model and its usefulness as a practical tool for site location research in an uncertain economy. Suggestions and recommendations are also given on other scenarios in which the model could be applied.

Finally, Chapter 9 will look to synthesise the findings of the whole project and draw some overall conclusions. Assessing the contribution of this work, the aim and research questions outlined in Chapter 1 will be returned to, and the extent to which each has been met will be examined. There will be areas of success, but undoubtedly questions still to be answered with avenues of future research still to be explored, so the final section of this chapter will offer suggestions of avenues where future research may be usefully pursued.

Chapter 2

Great Britain in Recession: The Worst in Modern History

2.1 Introduction

Since Great Britain (GB) went into recession during 2008 and 2009 and again in 2012, there has been a body of growing literature documenting the causes, developments and subsequent impacts of the economic downturn. The impacts of the recession have been widespread, varying by industry, socioeconomic status, demographic group and geographic area. As such, many commentators have labelled it the ‘Great Recession’ and the worst economic decline since the Second World War (Chari *et al.*, 2008; Gregg and Wadsworth, 2010; Chadha and Warren, 2012). However, before this statement can be realistically challenged, it is crucial to document the literature surrounding recession in GB and establish what is already known. This will make it possible to answer a number of important questions. For instance: What is meant by recession? How did the recession begin? Did it vary geographically? How do previous recessions in GB compare? How does a recession influence supply and demand in retailing?

Taking the above into consideration, Chapter 2 will be split into two parts; the first concentrating on the most recent economic downturn (Section 2.2) and the second examining previous recessions in GB (Section 2.3). In Section 2.2, considerations will initially be given to the origin and development of the recent recession. This will read almost as a timeline, documenting the contributing factors that initiated the recession. However, to prevent this becoming too descriptive, a number of theories, arguments and ideologies will also be explored. The remaining components of Section 2.2 will then concentrate on the actual impacts of the recession. Specific attention will be given to labour market, whether or not there has been a geographical divide and the effect on consumers in the food retail market. Once the specific literature on the recent recession has been discussed, attention will then be focused towards recessions of the past in Section 2.3. This will follow a similar structure to Section 2.2, beginning with the origin and workings of previous recessions in GB, before moving onto their eventual impacts. Finally, the chapter will end with a conclusion, summarising the main points

and highlighting the subsequent questions which need to be explored in the remainder of the thesis.

2.2 ‘The Great Recession’

As stated, this section will read in the form of a commentary, documenting the various stages of the most recent economic downturn. The section will start with the literature reporting the origin and development of the recession (Section 2.2.1); covering the sub-prime mortgage crash, financial deregulation and the ‘Credit Crunch’. Section 2.2.2 will then look more closely at definitions of recession and the response of the Government to the economic downturn. The remaining sections will then concentrate on the recorded impacts to date. Section 2.2.3 will cover the labour market (industry, employment, demographics). Section 2.2.4 identifies the geographic impacts (international, regional and local), Section 2.2.5 highlights the impacts on consumers and the retail market and, finally, Section 2.2.6 examines the various predictions for recovery. This comprehensive approach is necessary because only when the causes of the recession are explained can the impacts triggered by the economic crisis be fully understood.

2.2.1 Origin and Development

Sub-prime Mortgage Industry

One factor which remains constant in the literature regarding the origin of the recession is the collapse of the United States (US) sub-prime mortgage industry in 2007 (Nesvetailova and Palan, 2008; Langley, 2008; Radice, 2008; Ostrup *et al.*, 2009; Melvin and Taylor, 2009). By industry definition, sub-prime mortgages refer to those mortgages priced above the ‘prime’ interest rate, offered predominantly to financially unsophisticated borrowers living with poor credit ratings, low income and high unemployment (Sidaway, 2008; Langley, 2008; Manual, 2009). Consequently, these types of loans are often described as predatory lending, criticised for providing fertile ground for abuse, fraud and exploitation. It would appear from the scale of the negative backlash in the media that sub-prime mortgages are a new phenomenon which brought about this financial downturn. However, the rise of sub-prime lending started in the early 1990s with refinance loans, often in the poorer parts of the US. Increasing default rates led to a first subprime mortgage crisis as far back as 1997, as people failed to meet rising repayments. As a result, the growth of sub-prime lending halted for a few years, but picked up again after 2000 and continued to become increasingly popular up until 2007 (Manual, 2009). The newly found interest in sub-prime mortgages was mainly due to rocketing house prices across the US, fuelled by a long period of macroeconomic stability synonymous with low interest rates and expanding credit supply (Ostrup *et al.*, 2009). Investors worldwide craved a stake in the lucrative US

housing market as a number of mortgage lenders packaged up sub-prime loans into tradable securities to sell on to investors (securitisation). The continuation of rising house prices and stable macroeconomic conditions within the financial market created a favourable breeding ground for reckless risk taking (ALDE, 2008). Basic rules were forgotten as many sub-prime mortgages in the US continued to be authorised on the basis of the property/asset value and not the ability of the consumer to repay the loan. This phase of speculation was illustrated by the high level of financial innovation including the rise in off-balance sheet finance and rapid growth of the Originates and Distribution Model (ORD). Under this principle, the bank acts as a competitive financier aiming to maximize fee and commission income from originating assets, managing those assets in off-balance sheet affiliate structures, underwriting the primary distribution of securities collateralized with those assets and servicing them (French *et al.*, 2009). As interest rates climbed from 2004, onward and real wages stagnated or fell for many people and, similar to the late 1990s, the number of mortgage defaulters steadily began to increase. Those consumers who had taken out their mortgages with low teaser rates could no longer afford to keep up the repayments. By 2007, “...it soon became clear that many of the securities based on sub-primes mortgages were in effect valueless” (Radice, 2008: 2).

As a result, the number of defaults rocketed and house prices in the US and the United Kingdom (UK) began to fall dramatically. Despite the rising defaults, the US Government believed that the sub-prime mortgage crisis could still be contained towards the end of 2007. Stock markets began to identify those banks at risk by driving down their share prices, whilst stronger banks sought to strengthen their balance sheets by injections of capital from wealthy investors, especially the sovereign wealth funds set up by governments in the oil producing countries of the Middle East. Also, many felt that the continuing growth of China and India would cause the world economy to keep growing by offsetting the losses made by other countries (Radice, 2008). Furthermore, it was feasible to believe that the sub-prime mortgage industry would recover, considering that housing markets are notoriously cyclical, and for more than a decade it was a largely undisputed and extremely profitable venture (Nesvetailova and Palan, 2008; Langley, 2008).

Financial Competition, Market Deregulation and Risk

Regardless of the perceived confidence, the crisis began to worsen and transformed into what is now known as the ‘Credit Crunch’ during the middle of 2007. Historically, banks have always relied on short-term borrowing to meet immediate needs. However, in the summer of 2007, the problem of mortgage debt made banks realise that even short-term interbank loans were at risk of insolvency. Those who had previously bought the mortgage based securities from banks and building societies now refused to continue doing so. The result of this was that two hedge funds

managed by Bear Stearns, the fifth-largest US investment bank, had to be wound-up and UK bank Northern Rock could no longer finance its planned lending (Ostrup *et al.*, 2009). The crisis then entered a new phase when the US Government in September 2008 decided not to intervene and save the fourth largest investment bank, Lehman Brothers, from bankruptcy. From this point on, the optimistic outlook was discredited as it was no longer a sub-prime crisis but a more general global crisis of liquidity in which any bank or investor felt unable to trust any borrower. The evaporation of liquidity and collapse in confidence heralded the beginning of a much more severe crisis threatening the entire global financial system. The impact this had on the UK housing market was huge, with the number of property sales decreasing by approximately 40 per cent between 2007 Q2 and 2008 Q2 (Campos *et al.*, 2011). With the benefit of hindsight it should have been obvious when the mortgage finance boom was in full motion from 2001 to 2006 that it was almost certain to be unsustainable. Nevertheless, whilst some warned that the enormous build-up of housing and consumer debt in the US and UK would inevitably end in a massive downward financial correction (Shiller, 2005; Pettifor, 2006), such warnings were either disregarded or dismissed by the banks themselves, by regulators, by governments, and, it has to be said, by the vast majority of economists (Martin, 2011).

The main reason that the financial crisis went global is believed to be a combination of persistent large global macro-economic imbalances, caused by long periods of excessively loose monetary policy (Mohan, 2007; Melving and Taylor, 2009), growth in importance of the international inter-bank loan market and rising competition which developed between major international financial centres (Clark, 2002; Faulconbridge *et al.*, 2005; Grote, 2008; Radice, 2008). The global financial system has, for the last 30 years, been transformed by the rise of neo-liberalism, an economic ideology which represents the revival of the free market and free trade philosophy (Radice, 2008). During the 1980s and 1990s, the new economic doctrine developed into a universal model for economic policy makers, centred on privatisation of the public sector and the deregulation of markets for labour, goods and credit. The neo-liberal approach then penetrated deeply into the crucial areas of credit provision through accelerated globalisation. Consequently, the financial market became highly deregulated under the belief that financial institutions were sufficiently sophisticated and forward thinking to develop risk assessment models, and the financial markets argued as requiring little supervision, were rational, logical and self-correcting (French and Leyshon, 2004; Ostrup *et al.*, 2009).

The impact has been a financial economy of intense spatial competition between London and New York, excessive risk taking (e.g. sub-prime mortgages and hedge funds) and a lack of transparency in huge cross-border financial flows (Martin, 2011; Chadha and Warren, 2012). As a result, over the past few years, the economy has seen an uneven distribution of wealth across

the world. More specifically, the current crisis has been facilitated by a more recent episode of recycling, which has been driven by global redistribution of wealth and income towards countries exporting commodities and the rise of sovereign wealth funds, based in the Middle East and Asia in particular. Sovereign wealth funds in the Middle East are a continuation of the long-term strategies of oil-producing nations to maximize the returns of their revenues and to build sufficient assets to ensure a successful post-oil future (French *et al.*, 2009). Therefore, at a time when credit was being restricted, a sharp rise in oil prices during 2008 only heightened the pressure on company finances, reinforcing the corporate drive to rein in on capital spending and reduce costs. Inflation also rose rapidly in 2007-08 with the Consumer Price Index (CPI) reaching a high of 5.2 per cent and Retail Price Index (RPI) reaching 5 per cent (Campos *et al.*, 2011), driven by demand from thriving China and India, pushing up petrol prices, food prices and other basic costs. This surging inflation also prevented central banks from cutting interest rates to help ease the financial crisis.

Response to the Financial Crisis

Decreasing international barriers and increasing financial interconnectedness caused by globalisation soon accelerated the spread of the crisis by generating a ripple effect which exposed the fragility of the world's financial system (Martin, 2011). As the financial crisis moved into the latter part of September 2008, fear and uncertainty gripped the economy and it was clear that many national economies would not recover without intervention. This led to major criticism of the domineering neo-liberalism paradigm of the past three decades. As a result, governments were being driven to desperate measures to perform the emergency rescue of banks and inject funds to restore confidence. The response to the financial crisis during 2008 in US and the UK represented a remarkable about-turn in both countries' attitude towards neoliberal politics. Policy shifted towards the urgent need to recapitalise banks; and with few private investors (not even the sovereign wealth funds) willing to put up fresh capital to prevent wider systemic failure and contagion, there was an effective nationalisation of failing financial institutions (Manual, 2009; French *et al.*, 2009; Radice, 2008). Those banks in the US included Federal National Mortgage Association (FNMA), Federal Home Loan Mortgage Corporation (FHLMC) and American International Group, and Northern Rock and Royal Bank of Scotland (RBS) in the UK (early 2008). In addition, 'shotgun marriages' were initiated to save failing institutions (such as the takeover of HBOS by Lloyds TSB and Bradford & Bingley by Banco Santander). The British Government also devised an unprecedented 'rescue plan' for the entire British banking sector which involved it being underwritten by taxpayer's money. It is without doubt that these actions represent a blow to the ideological purity of market-led ideas of neo-

liberalism that had previously dominated Anglo-Saxon economy, society and polity (French *et al.*, 2009).

Nevertheless, it quickly became clear towards the end of 2008 through the collapse of the over-extended Icelandic banks that national intervention would simply transfer the pressure and the panic to the next country in line. As the Icelandic banks buckled, the savings of thousands of British investors evaporated as it was discovered that they were not covered by UK deposit insurance. In order to protect these deposits, the UK Government mobilised anti-terrorist legislation to freeze the UK assets of Icelandic banks, causing a deep rift between the UK and Iceland which resulted in the latter considering initiating legal action against the UK (Ibison, 2008). Furthermore, those areas of the globe previously thought to be out of reach were also being drawn into the crisis. For instance, even governments in continental Europe and East Asia were equally incapable of decisive and effective public intervention as the crisis subsequently spread to the financial sectors in European and Asian economies (Radice, 2008; Ostrup *et al.*, 2009). Consequently, with many countries requiring financial bailouts, the long side-lined International Monetary Fund (IMF) stepped forward. In November 2008, the IMF approved a £1.4 billion loan for Iceland, after the country's banking system collapsed in October, the first IMF loan for a western European nation since 1976 (Telegraph, 2009a). After decades of uneven globalisation, this was the start of what some academics are terming 'reversed globalisation' (Mohan, 2009); for the bailouts by the IMF for More Economically Developed Countries (MEDCs), structurally increasing oil prices has contributed to a shifting global power balance to many of the new emerging economies.

2.2.2 Great Britain in Recession

Recession: 2008 to 2009

In October of 2008, the worst was confirmed – the financial crisis could not be contained and the UK was publically declared by the Office for National Statistics (ONS) to be in a recession (Chadha and Warren, 2012). The official and more widely accepted definition of recession is when an economy records two consecutive quarters of negative growth (Clancy, 2009; Campos *et al.*, 2011). Alternatively, recession can also be defined as a period when the economy is growing at below its long-term trend rate of growth – which for Britain over the past 25 years is between 2.5 to 3 per cent a year (Vaitilingam, 2009). However, in this research, the more widely accepted definition of recession supported by the ONS will be used. Gross Domestic Product (GDP) figures recorded a fall of 1.8 per cent in the third quarter of 2008 after a 0.5 percent drop in the previous quarter (Campos *et al.*, 2011). This contraction in the real economy over two consecutive quarters was a final sign that the global financial crisis had spilled over into the

wider economy as Britain followed Denmark, Estonia, Latvia, Ireland, Singapore, Iceland and Australia into recession (Chadha and Warren, 2012). The lack of available credit had begun to strangle firm's abilities to make investments, employ workers and, for some, to even function at all. Additionally, the heightened uncertainty was even causing the minority of businesses with access to credit to postpone investments, with the only other option in such uncertain times to wait it out and do nothing at all. As a result, a number of companies could no longer continue and failed to adapt to the changing economy, leading to widespread business foreclosures and unemployment. The extensive impacts from the recession will be discussed in more detail in Sections 2.2.3, 2.2.4 and 2.2.5.

In 2009, in an attempt to encourage interbank lending and boost consumer and business confidence in the economy, the Bank of England made two interferences. The first was to lower interest rates to a historic low of 0.5 per cent (Edwards and Irwin, 2010; Campos *et al.*, 2011; Chadha and Warren, 2012). This had wider implications for the rate of inflation which dropped as a result. Movements in interest rates work mainly by influencing the overall level of demand in the economy and so can have a powerful influence on the inflation rate. It was believed that the lowering of interest rates and inflation would help maintain a stable economy and the value of money. The second response was to increase the supply of money and inject liquidity into the economy through buying government and corporate bonds (quantitative easing) (Cook and Hayman, 2012). Other temporary responses to combat the recession were a stamp duty holiday up to the higher threshold of properties under £175,000 to try and stimulate demand in the housing market. A reduction in VAT was also made from 17.5 per cent to 15 per cent, aimed at putting more money in consumer's pockets (Thomas *et al.*, 2010). Both of these measures ran until the end of 2009. Additionally, the Government introduced the UK Scrappage Scheme in an attempt to encourage spending in the motor industry. Through the scheme, customers were able to purchase brand new cars with a heavy discount of £2,000 if they trade in a qualifying old car (UKCarScrappageScheme, 2009).

Double-Dip Recession: 2012

After five consecutive quarters of contraction to the economy, in the third quarter of 2009, the UK recorded a growth in GDP of 0.4 per cent (Edward and Irwin, 2012). However, the threat of recession was ever looming as the global economy was not yet on a firm recovery path and fears over unemployment still remained. Despite not being officially in recession by the standard definition, GDP was by no means constant. In the first quarter of 2010 VAT returned to 17.5 per cent (then was increased again to 20 per cent the following year) which halted the previous boost in consumer spending (Thomas *et al.*, 2010; Gregg and Wadsworth, 2010). Furthermore,

rises in gas and electricity bills, along with transport costs and food prices, pushed prices up further. As such, by September 2011, CPI was 5.2 per cent, matching the record high set in September 2008 and the RPI rose to 5.6 per cent, the highest annual rate since June 1991 (Seaton, and Waterson). Crucially for household incomes, wage growth was still tracking well below the rate of inflation (Campos *et al.*, 2011) which meant households budgets and purchasing-power were being squeezed.

The recovery hit a major blip towards the end of 2010 as the focus of recovery shifted to fiscal consolidation on account of soaring public debt. More specifically, in order to deal with the increasing level of national debt, the UK Government introduced a number of austerity measures through a spending review in 2010. Outlining the £81 billion spending cuts package, Chancellor George Osborne vowed to restore sanity to public finances and stability to the country's economy (BBC, 2010). However, the effects of such measures would involve the loss of thousands of jobs, massive cuts across many government departments, wholesale reform of public housing and further cuts to the welfare budget. Some of the more severe cuts would also come to the budget for sport in schools, the Ministry of Justice, the Department for Communities and Local Government, the Culture Department, the prison programme and to legal aid. Arguably the single most radical public service reform was a near £4 billion cut in the social housing budget, affecting the most vulnerable members of society (MacLeavy, 2011). Local governments were also hit particularly hard as the Coalition Government moved to decentralise control. There is a debate, however, as to whether this decentralisation of power will have the desired effect. For instance, while decentralisation may enable local leaders to improve economic performance by managing their own budgets, it also creates issues for central government – especially in policy areas where local leaders are unwilling or unable to take action that benefit growth (Overman, 2011). Moreover, with the amount of money that local governments receive from central government being reduced by 7.1 per cent, it almost looks like a way to shift blame away from central government should local governments fail to manage their finances. Other notable changes were a planned rise in the state pension age for men and women to 66 that will start in 2020, six years earlier than scheduled.

In addition to the 'frontline' cuts, the Government also announced that the cap on undergraduate tuition fees for British students would increase from £3,300 to £9,000 per year for students starting their studies in 2012 (Wakeling and Jefferies, 2013). It was hoped that the increase in the cap would result in price variation among universities. However, it has since become clear that it was underestimated how much universities would decide to charge students; in fact the average fee charged by higher education institutions will be around £8,500 per year (Wakeling and Jefferies, 2013) – making the UK a country with amongst the highest tuition fees charged in the world. The education cuts and decision to raise tuition fees was met with great opposition

from students with many participating in multiple student protests across the country in 2010 (Whiteley, 2012). London was the primary target, with many demonstrations turning violent as more than 52,000 students marched on Westminster. In the wake of the harsh cuts which were to be implemented during 2011, the student riots were not in isolation. In 2011, disturbances started after a protest in Tottenham following the death of Mark Dugan over boiled. The resulting chaos generated looting, arson and a number of violent clashes with police (for a more in-depth discussion see Bridges, 2011). The riots have generated significant on-going debate among political, social and academic figures about the causes and context in which they happened. However, amid the wealth of structural factors such as racism, classism, gang culture and criminality, is the recent economic decline brought about by recession and harsh austerity measures (Bridges, 2011).

After a year of uncertainty, the UK found itself in recession once more as GDP dropped 0.2 per cent in the first quarter of 2012, signalling two quarters of decline and the first double-dip recession since 1975 (Campos *et al.*, 2011). In response, the Government once again turned to quantitative easing, injecting £75 billion of new money into the economy (since been expanded in steps up to the current level of £325 billion). This time round, however, the decline would only last for three consecutive quarters as the GDP grew by 0.9 per cent in the third quarter of 2012. In returning to recession, the austerity methods of Coalition Government have come under extreme criticism (Whiteley, 2012). The ranks of commentators who view austerity as potentially self-defeating have swollen (Krugman, 2010; Cafiso and Cellini, 2011; Cottarelli, 2012). These authors argue that the weak output growth caused by fiscal austerity have fuelled market doubts about government solvency. Higher funding costs, combined with lower activity thus worsen the fiscal position, defeating the very purpose of the initial tightening measures. Furthermore, short-run fiscal austerity in the face of a depressed economy does not reassure investors. Thus, what is needed, according to this perspective, is not belt-tightening, but further spending (MacLeavy, 2011). However, others would postulate that policymakers in fact did the right thing in saving the banks, cutting interest rates and inducing fiscal and monetary stimuli, all of which have helped maintain demand and firms' cash flow (Gregg and Wadsworth, 2010). Moreover, Cook and Hayman (2012) argue that the Government largely succeeded, as it prevented the recession from turning into another 'Great Depression' (see Section 2.3). In fact, without the banking bailout, the fiscal stimulus, quantitative easing and attempts at reducing the deficit, the situation would have been catastrophic.

2.2.3 Impacts on the Labour Market

Coupled with falling GDP, the 'Great Recession' also brought increased rates of unemployment. In the standard definition used by the ONS, unemployment refers to a person

not only out of work, but also actively looking for work and available to start work within a fortnight (ONS, 2012). The claimant count is also often used to measure unemployment which details the number of people receiving Jobseeker's Allowance (JSA) in a particular month – supplied by the Department for Work and Pensions (DWP). During harsh economic climates, unemployment is often regarded as a ‘lagging’ indicator because businesses will often delay enforcing redundancies as long as they can in difficult times. Unemployment reached its peak in 2011 at 2.68 million the highest it has been in 17 years (Campos *et al.*, 2011). At the time of writing, unemployment levels are on the decline, however official unemployment figures still stand at 2.5 million (8 per cent) (ONS, 2010c). Interestingly, however, in comparison to the dramatic fall in GDP, the loss of employment which resulted from the recession has actually been much smaller (Gregg and Wadsworth, 2010).

Impacts on the Labour Force

Edwards and Irwin (2010) also point out that it has been some of the most vulnerable groups which have suffered the most from unemployment – such as the low qualified, young adults, and minority ethnic groups (Barham and Walling, 2009; Berthoud, 2009; Muriel and Sibieta, 2009). This has meant that managerial, professional and skilled occupations have not suffered as greatly in comparison with manual occupations, particularly low-skilled ones (Muriel and Sibieta, 2009). It is important to note, however, that prior to the economic downturn, employment rates were already lower for those without qualifications. Therefore, Hutton and Lee (2012) point out that the recession has actually just accelerated this structural change. In the context of gender, claimant count and unemployment rates have increased much more for males than for females (Lee *et al.*, 2009; Sunderland, 2009). However, this can arguably be explained by the fact that men were more likely to be employed in the industries which have experienced job losses (e.g. manufacturing and construction). Lee (2012) also points out that women are more likely to be employed in counter-cyclical industries (e.g. the public sector, education and healthcare).

In addition, young people aged 18-24 (specifically men) have seen some of the most significant increases in unemployment rates, albeit within the context of an historical shrinking of labour force participation amongst this age group (Edwards and Irwin, 2010). The short-term effects mean that school leavers and graduates are finding themselves out of work or in jobs which do not match their skills or qualifications, losing out on existing vacancies to those with greater experience and proven job histories. However, there could also be long-term issues, as those who experience early periods of unemployment are more likely to be unemployed later in life and likely to earn less in the future (Lee *et al.*, 2009; Coe and Jones, 2011). Of the groups aged

25 upwards, it is those aged 25-34 that have also seen some of the more marked percentage increases in unemployment levels (up to 6.7 per cent in early 2009) (Barham and Walling, 2009). As this latter increase falls at a stage in the life-course when many people are having children and family-building, it may be particularly problematic for some (Edwards and Irwin, 2010). Clearly households that are most dependent on income from earnings are most vulnerable to being hit by recession – compared, for example, to pensioners who can fall back on other sources of income (Muriel and Sibieta, 2009). Edwards and Irwin (2010) also make the point that whilst unemployment is a relatively straightforward index of the impact of recession, there are other important secondary effects brought about by economic uncertainty that relate to people's perceptions, practices and well-being. For example, several in-depth studies attest to the links between household vulnerability, tensions and arguments within families caused by money worries, and extensive concerns for family life associated with difficulties in planning ahead, created by economic uncertainty (Ben-Galim, 2009; Edwards and Irwin, 2010).

In conjunction, many individuals still in employment have also been impacted by the recession. For instance, average weekly hours worked fell by almost 1 hour from 32.1 hours to 31.2 hours during 2008 to 2009 (Campos *et al.*, 2011). In order to preserve employment levels, many firms turned to reducing the number of hours worked by employees. However, whilst preserving employment levels, this behaviour actually constrains workers to work fewer hours than they may otherwise be willing to. According to the Labour Force Survey (LFS) estimates, there were a total of 3.5 million workers (12.1 per cent of the total population in employment) who wanted to work longer hours in 2009. In addition, in 2008, the rate of increase of both basic and total earnings started to slow down. During 2009, total earnings fell sharply, driven by a large fall in bonuses payments, mainly in the financial sector (Campos *et al.*, 2011). The basic earnings rate of change fell continuously into 2009 whilst the annual percentage change of basic earnings fluctuated above and below the inflation rate (Gregg and Wadsworth, 2010; Martin, 2011). This meant that, for those for whom basic earnings payments made up the majority of their income who were able to keep their job and the same working hours, the situation may not have worsened during 2009 (Campos *et al.*, 2011). In fact, for those with mortgage interest payments, the economic situation will have actually improved because of low interest rates brought about by a reduction in the RPI, which includes mortgage interests.

Industry Specific

A common theme within the literature also tackles the issue of unemployment and how it has differed greatly by industry and sector. Due to the nature of the financial crisis, it was initially forecast that in addition to financial services, business services, construction, retail and any

industries reliant on consumer spending would be worst hit (Drury, 2008; Parkinson *et al.*, 2009; Lee, 2012). However, due to the various banking bailouts discussed previously, the financial sector has remained relatively resilient. Instead, because of the slowdown in the UK housing market, it has been businesses within the construction and manufacturing industries that have taken the brunt of reduced output and increasing unemployment (Lee *et al.*, 2009; Gregg and Wadsworth, 2010; Martin, 2011; Hutton and Lee, 2012). More specifically, Gregg and Wadsworth (2010) comment that in manufacturing and construction 8 to 10 per cent of employment have been lost compared to services which have remained under 2 per cent. However, within the service sector there is considerable variation. In the public services of education, health and administration, employment has grown by 4 per cent, and employment has fallen by around 4 per cent in finance, retailing (and transport) (Gregg and Wadsworth, 2010). It must be noted that while these proportionate rates of decline are well below those of construction and manufacturing, because these latter sectors are larger, they actually account for around half of the total jobs lost. Unemployment in the services sector can largely be accredited to the decline in consumer confidence which plummeted in 2009. For instance, between 2009 and 2011, a number of firms within the motor industry, retail sector and other service industries recorded large losses in both output and employment (Lee, *et al.*, 2009; Gregg and Wadsworth, 2010). Some of the biggest casualties to date have been Woolworths, Zavvi, USC, MFI, Jesspos, HMV, COMET and Motor World (consumers and the retail sector will be discussed in more detail in Section 2.4.4).

2.2.4 A Geographic Recession?

The role of geography with regards to the economic downturn has already been discussed to some degree, for it was the interconnectedness of the global economy which contributed to the financial crisis being so widely felt. One might argue that the fact that the financial crisis even infected markets across the globe suggests that geography does not actually matter (Martin, 2011) – after all, almost everyone, almost everywhere, has been affected in some way. According to this view, the process of globalisation that has occurred over the past three decades has, to all intents and purposes, rendered geography irrelevant (O'Brien, 1992). Nevertheless, it is clear that geography has been intrinsic to the development of the recent recession in GB and to its subsequent economic impacts. The crisis is thus a valid subject for geographical enquiry, since it provides a major opportunity to examine how the local and the global spheres have become inextricably intertwined (Manual, 2009; Martin, 2011). Furthermore, the question of geography remains an important one for both policy-makers, who may seek to target scarce resources at cities with weak economies, and for urban policy-makers

trying to make their cities more resilient against future economic crises (Christopherson *et al.*, 2010).

In the same way the recession has impacted upon different industries and individuals, the effects have also been spatially uneven across the country. In the aftermath of the financial crisis, the dominant narrative amongst commentators was that cities reliant on financial services would experience the largest falls in GDP and increases in unemployment (Lee, 2012), the logic being that the recession would be worse in those sectors from which it developed. Therefore, because of the strength of the banking sector in London, the assumption was that those in London and the South East would suffer the most. Drury (2008) commented that “...workers in London and the South-East would bear the brunt of the recession” (Drury, 2008, p1), whilst Stewart *et al.* (2008: 1) stated that “...it would be ‘grim down South’”. Others have also hypothesised that the recession could in fact lead to a fundamental shift in the economic geography of GB by reducing the country’s North-South divide (Vaitilingam, 2009; Lee, 2012).

Initially, it appeared as if the predictions may have been correct as the financial sector was subject to some of the first mass lay-offs (Vaitilingam, 2009). However, the forecasts would prove to be somewhat overstated as the financial sector was actually performing relatively better than most industries by 2009. One reason for this is that the banking collapse was followed by an injection of capital into the financial system, much of which was heavily focused on the capital. Dorling (2010) described this as a ‘bail-out for the South’. Furthermore, workers with high skill levels proved to be generally more resilient to the recession which meant cities such as London became almost ‘protected’ (Storper and Scott, 2009). Instead, as the recession took hold of the British economy through 2009, it was the North of England that was affected the worst by the recession. Table 2.1 exemplifies disparities in output, employment and unemployment by Government Office Region (GOR) in GB. It is evident that between 2007 and 2009, the West Midlands had the highest increase in unemployment followed by the North East and Wales. Conversely, contrary to the initial predictions, unemployment change was lowest in London and the South East. Other areas recognised as being hit particularly hard in the literature include the North West and Yorkshire and the Humber, again two northern GORs (Campos *et al.*, 2011; Lee, 2012; Martin, 2011; Hutton and Lee, 2012) heavily reliant on manufacturing, construction and retailing (see previous section). Nevertheless, whilst this regional level analysis provides useful insights into the basic geographic trends of the recession, there is little evidence within the literature of any analysis at the sub-regional or local level.

Interestingly, within London, the highest unemployment rate in 2009 was in Tower Hamlets at 11.3 per cent – which was also the highest rate in the country at the time. In comparison, the lowest unemployment rate in the capital was in Richmond-upon-Thames at 3.7 per cent

(Vaitilingam, 2009). This polarisation highlights the complexity involved with studying the capital as the geographic-industrial relationship is incredibly multifaceted. There is evidence for example, that local authorities with high levels of employment in Standard Industrial Classification (SIC) 65 (Financial Intermediation, except insurance and pension funding) and SIC 67 (activities auxiliary to Financial Intermediation) recorded higher rises in the claimant count than other areas (Lee, 2012). However, this was only in cases outside of London. This is arguably because high profile skilled employment in the headquarters of the firms is likely to have been retained, and staff laid off in London may have been more successful in finding re-employment. In an attempt to explore the ‘London’ effect, Lee (2012) explores the impact of the recession on London through a set of multiple regression models. Conclusions were made that the ‘London effect’ is suggestive but inconclusive, as the variable, while negative, is not significant.

Table 2.1 Variations in output, employment and unemployment by GOR

	Output % change 2008(Q1) – 2009(Q2)	Employment % Change 2008(Q1) – 2009(Q2)	Unemployment % change 2007 (Q3) - 2009 (Q3)
West Midlands	-8.2	-3.4	3.6
North East	-8.6	-3.6	3.0
Wales	-6.9	-1.8	2.8
Yorkshire & the Humber	-7.3	-3.5	2.7
North West	-6.7	-2.3	2.6
East Midlands	-7.6	-4.4	2.2
South West	-5.0	-2.5	2.2
Eastern	-4.8	-1.3	1.7
Scotland	-4.7	-2.4	1.7
South East	-4.9	-2.9	1.5
London	-4.8	-1.9	1.5

Sources: Martin (2011); Hutton and Lee (2012)

2.2.5 Consumers and the Retail Market

So far, much of the discussion in this chapter has been primarily focused on the inner workings of the financial crisis, the recession and the broader economic impacts that it has triggered. Therefore, in this section, considerations will be steered towards the main focus of the thesis – the impact of the economic downturn on the retail market and more specifically the food retail market. Where possible, evidence from the most recent literature will be provided. However, a number of examples will also be given from other sources such as trade journals as this area still remains somewhat under-researched in academia.

Consumer Behaviour

Prior to the onset of the recession, many believed that the 'Credit Crunch' could actually be contained. The responses by the UK Government helped curtail the effects of the financial crisis to an extent (see Section 2.2.1); however, rising unemployment and concerns about job security prevented the extreme forms of monetary policy having the desired impact. Consequently, as the economic outlook continued to deteriorate for much of 2008, consumer confidence worsened dramatically and effectively pushed the economy into a recession (Gregg and Wadsworth, 2010). Consumer confidence is essentially an economic indicator which measures the degree of optimism that consumers feel about the overall state of the economy and their personal financial situation (Pain and Weale, 2001). Thus, how confident consumers feel about the stability of their incomes determines their spending activity and therefore serves as one of the key indicators for the overall shape of the economy.

As one might expect, due to the nature of the recession, since 2009, credit has become difficult to obtain for consumers and retailers as banks have become more risk adverse. This restriction of credit, alongside sudden uncertainty about economic prospects, meant that aggregate demand in the economy declined between 2008 and 2009 (Gregg and Wadsworth, 2010). Consumers could no longer borrow to finance existing debt and mortgages become more difficult to obtain (Lee, 2012). Therefore, in attempt to kick-start consumer spending, the Government has kept interest rates low since 2009 (see Section 2.2.2). The rationale is that low interest rates would increase demand because of low incentives to save, as well as reducing the costs of borrowing and servicing existing debts such as mortgages. Nevertheless, Lee (2012) claims this can be counterintuitive because lower interest rates will reduce incomes for those who save and consumers reliant on investment income – such as pensioners. In the context of retailers, the lack of credit means that firms find it harder to finance future investment, reducing demand in the economy (Gregg and Wadsworth, 2010; Lee, 2012). Moreover, existing debt is harder and more expensive to finance and many firms are thus struggling to gain insurance. This has consequences for the supply chains of many firms who have found themselves unable to buy new stock to sell and in some cases leading to collapse (e.g. Woolworths, GAME and HMV).

Donald (2013) states, that the financial crisis of 2008 and subsequent recession have been a watershed moment in the evolution of our economic geography. This is expanded upon by Gritten (2011) who believes a paradigm shift in consumer confidence has taken place with the recession forcing people to evaluate their personal and household finances whether they are rich or poor, young or old. For example, many people no longer seem overwhelmed by the desire to borrow and consume; instead, they are planning to live within their means (Donnan, 2009). The combination of restrictions on credit, high energy costs, rising prices of products (mainly food)

rising unemployment and stagnating wages (a major driver of consumer spending) have been squeezing the earnings of consumers (Ferne *et al.*, 2010; Campos *et al.*, 2011), and thus demand, which has made stabilising output impossible (Gregg and Wadsworth, 2010). Since 2008, consumers have been holding back on frivolous and non-essential spending to help reduce household expenditure. Customers are now actively searching for bargains and new ways to cut costs on items such as as personal finance, energy, leisure actives, groceries, alcohol and personal care (Intel, 2009a; Reuben, 2009; Hardie, 2009; Retail Technology, 2009a; Thompson *et al.*, 2010a; Bondy and Talwar, 2011). People are also seeking out own label brands, going out less often and reducing their alcohol consumption (Gritten, 2011; Bondy and Talwar, 2011). Tour operators and airlines have also seen considerable effects, as more people are opting for cheaper plane tickets, reducing the number of days spent on foreign holidays and reverting to holidaying at home in the UK (Reuben, 2009). Furthermore, in May 2009, despite the introduction of the Scrappage Scheme, new car registrations were down 24.8 per cent compared with the same month the previous year (IMI, 2009). Interestingly however, similar to the findings in Section 2.3.4, this economic frugality is more pronounced in rural areas and with increasing distance from London (Gritten, 2010). Moreover, research would also suggest that it is the younger consumers who have reduced spending the most, although this is not surprising considering the levels of unemployment in the younger age groups (ONS, 2012b).

Looking specifically at the grocery market, Gritten (2010) states that 50 per cent of people are actually cutting back on food, and that a new stoicism is emerging after the previous decade of decadence (particularly for the financially distressed segment of society). This is contrary to many other reports that suggest the grocery market has performed relatively well since 2008 (McEleny, 2009; Costa, 2010; Donald, 2013). More specifically, food retailers have benefited hugely from consumers eating out less, preferring instead to save their money and spend more on their weekly grocery shop (Bradbrook, 2008; Mitchell, 2009). Whilst this has been detrimental for restaurants and public houses, grocery companies have reaped the rewards of people purchasing more bread, frozen meals, coffee and side dishes (Intel, 2009b). Additionally, Vaitilingam (2009) argues that the recession has even triggered an increase in green products, local produce and healthy foods – arguably a response to help save local jobs and prevent store closures on the high street. Boitoult (2008) attempts to provide some clarity on these conflicting points – concluding that whilst sales have in fact been high in the grocery market following the 2007 financial crisis, the high rates of inflation that followed have been a major cause of reduced spending on customers.

The Impact on Retailers

The decline in consumer confidence and shift in spending behaviour has had an obvious impact on retailers in the British economy. Whilst retail actually performed well after the 2008 financial crisis (Costa, 2010), the retail market has still been affected by a number of closures and redundancies (Bennison *et al.*, 2010). Since 2008, 2012 was the worst year in terms of the number of retailers going into receivership. More than 50 retailers were affected in 2012 which accounted for almost 4,000 stores and 48,000 employees (CRR, 2013). This can largely be accredited to the second economic downturn which caused weak sales and the failure of a few retail giants such as Peacocks and Comet which inflated the figures. In addition, many companies were able to survive a year or so of recession but not four years of low profits or losses. Those companies affected in the last five years have included Comet, JJB Sports, Clinton Cards, Game, Borders, Barratts, Alexon, Habitat, Focus DIY, Adams Childrenswear, Thirst Quench, Principles, Allied Carpets, Dewhursts, Woolworths, MFI, and Zavvi/Virgin Megastore.

In conjunction, others would argue that the closure of shops occupied by failing retailers is not necessarily all doom and gloom. For example, the speed with which most former Woolworth's stores were re-occupied during 2009, especially by discount retailers such as B&M Bargains and Poundland shows a continuing adjustment to the prevailing environment rather than to its collapse (Bennison *et al.*, 2010). Furthermore, contrary to the reports that independent retailers have struggled in recent years, Bennison *et al.* (2010) highlight that nearly 11,000 more shops opened than were closed in 2009, with independents showing the greatest increases in numbers. This suggests more caution by the multiples but may also reflect the attraction of independent retailing as a livelihood in recessionary times, facilitated by low-entry barriers and lower rentals. Fernie *et al.* (2010) argue, however, that the problem was not the market conditions; instead some retailers were just not flexible enough (e.g. Woolworths). When the recession hit, some retailers got into trouble not because they could not sell products, but because they were not flexible enough, i.e. they were unable to switch off their pipelines of supply quickly enough.

It would appear from the literature that the issue of flexibility has not been too much of an issue in the grocery market. For instance, in order to deal with the shifting consumer behaviour, food retailers responded by changing prices accordingly. It might be expected that market leader Tesco (market leader) would be the first to introduce such price adjustments; however, Asda has actually been the leader on price falls and price rises (Seaton and Waterson, 2012). In comparison, Sainsbury's has been particularly keen on multi-buy/save offers (Boitout, 2008). Either way, it would appear that the grocery retailers have attempted to adapt to an environment being squeezed by rising inflation (Thomas *et al.*, 2010; Campos *et al.*, 2011). In response to rising food costs and the harsh economic climate, households are now shopping at discounters

such as Aldi, Lidl and the former Netto, buying own-label goods instead of items from the premium ranges (Bradbrook, 2008; 2009a; Hardie, 2009; Thompson *et al.*, 2010a; 2012). Whilst this has undoubtedly impacted on the bigger retailers such as Tesco, Asda and Sainsbury's, it has also provided an opportunity for increased competition within the grocery sector as some of the discounters regain some market share.

Online Retailing

The literature and surveys on the impact of the recession also illustrate how greater thrift and scepticism has influenced the various channels consumers use to purchase products. In 2009, online spending by consumers grew by £2.4 billion (Retail Technology Review, 2009b), a rate of growth in severe contrast to the historical decline being suffered by the total UK retail market. The internet provides a number of counter-recessionary characteristics which have enabled consumers to help combat the impacts of the recession. For example, it provides a mechanism to search for low-cost alternatives across a range of different retailers through increasingly popular price comparison sites (Kimberley, 2008; Consumer Behaviour Report, 2008; BBC, 2008; McEleny, 2009). Kimberley (2008) denotes how this has been particularly evident in the food retail market, because it helps in maintaining budgets and prevents wasteful impulse spending in a store environment. This is arguably because, as a method of shopping, it is disproportionately popular with the more affluent, and therefore, more resilient. For instance, a number of consumer based surveys claim there is some evidence of shoppers with lower household incomes abandoning the internet in favor of cheaper high street shopping at the likes of Primark, Matalan, Poundland and out-of-town retail outlets (Kimberley, 2008; Retail Technology Review, 2009b).

2.2.6 Post-Recession Predictions and Recovery?

Prior to the onset of the double-dip recession in 2012, the predictions and estimations for full economic recovery were varied but were generally clouded with much pessimism. It was expected in both the UK and the US that the eventual upturn in output would be slow and form a 'tick-shaped' recovery: a short, rapid rebound, but then a much slower haul for the rest of the recovery (Vaitilingam, 2009). This is attributed to the need to work off the excesses in the financial markets and the housing markets out of which the crisis emerged. Nevertheless, it is now known this was not the case as once the economy started recording levels of macroeconomic growth in 2010 and 2011, it was not long before the UK fell back into recession in 2012.

Moving forward into 2013 in what is a second period of recovery, the same sorts of questions are once again being asked. Initial short-medium term predictions show expected output to be

flat, implying 2013 will seem much like 2012, but ever so slightly easier (NIESR, 2013; CRR, 2013). However, this will not be the case across all areas. In the retail sector, sales on the high street through physical retail stores are expected to continue to decline. Instead, online retailers will secure the majority of the retail growth available, causing sales in UK shops and stores to fall in 2013 for the fourth year in succession (CRR, 2013). Moreover, in the grocery market, food prices are predicted to continue to rise in 2013 (Campos *et al.*, 2011; CRR, 2013), although this should relax later in the year. Consumer confidence and thus spending is still very low and is expected to remain so following the Chancellor's 2012 autumn statement in which he forecast that austerity measures would continue until 2018. The 'austerity conundrum' in the UK is that austerity is neither cutting our debts nor providing economic growth, although the deficit is reducing slowly.

These arguments can be supported when taking the alternative definition of a recession, a period when the economy is growing at below its long-term trend rate of growth (Vaitilingam, 2009). Consequently, it is likely the country will not be reverting back to pre-2007 growth levels for some time to come. The levels of growth will be very small (if at all), unemployment will still be high and consumers will continue to feel as though they are within a recession. It is also important not to confuse the end of the double-dip recession with a return to normality, as the economic shock which began in 2008 has the potential to create lasting changes in consumer attitudes and values (Donnan, 2009). For one thing, people will continue to be far more parsimonious with consumer credit, intent firstly on rebuilding their savings and building for the future. Flatters (2008) states that consumer confidence and spending cannot be turned on and off like a tap, thus recovery may not be reflected in consumer spending for some considerable time. Furthermore, the increase in internet retailing also demonstrates that retailers will need to adapt to the way in which consumers are behaving in the recession and prepare for how they will evolve after it. Even though this channel is predominantly used by the 'younger' generation, the size of 'elderly' demographic in proportion to the general population means they will eventually become a crucial target for retailers. Moreover, in just ten years' time, the heavy internet using 35-44 year olds will move into this demographic and take their internet shopping habits with them (Retail Technology Review, 2009b).

Finally, the long-term economic and political consequences of the global recession are still unknown, but there are a few things which remain certain. Just as the financial crisis of the late 1980s led to a wave of closures, mergers, acquisition and takeovers (Dymski, 1999); the present crisis has and will continue lead to a new wave of mergers and acquisitions, leading to many big conglomerates growing even bigger (Manual, 2009). This has already begun within the financial sector and to an extent the real economy (Asda buyout of Netto – see Thompson *et al.*, 2012). In

addition, considering how much Europe (UK especially) has been hit by this crisis and how fast Asia's economies are growing and changing, a shift towards stronger, better capitalised centres in Asia seems inevitable. As Asian economies grow and their current account surpluses grow alongside them, Asian money will become more and more important globally now that globalisation is coming full circle (Manual, 2009). Some companies have already begun to take advantage of this as Tesco is looking to expand in India and parts of Asia. To ensure recovery within the UK and avoid a 'triple-dip' recession, macroeconomic policy should continue to support the economy through monetary easing and keep the focus of monetary policy on price stability (Sentance, 2009), something learned in the wake of the previous three UK recessions.

2.3 An Historical Perspective of Great Britain in Recession

The current recession has already been termed the 'worst recession' since the Second World War. Nevertheless, it has not been the only substantial recession to impact on the GB in this time period, for there has never been capitalism without working through moments and places of crisis. It appears that the global financial system has become seemingly so complex and intricate; many have forgotten that the geography and history of capitalism is one of booms and busts (French *et al.*, 2009). Consequently, the following section contains a discussion of the literature about the causes and subsequent impacts of the recessions which occurred between 1973-76, 1979-82 and 1990-93. Rather than examine each of the recessions individually, the following section will be structured in a similar manner to Section 2.2. Initially, the origin, development and recovery of the different recessions will be discussed followed by their impacts, the geographic implications and finally the effects on consumers and the retail market. This will allow for comparisons to be made, help formulate possible research questions, identify gaps in the literature and give the extent of the current recession some historical context.

2.3.1 Recession: Origin, Development and Recovery

The apparent cause and development of the current recession has already been established in some depth. However, it is important to understand how this one differs or is in any way similar from those witnessed in the past. Subsequently, Figure 2.1 demonstrates the month-on-month percentage change in GDP for the selected recessions, including the most recent economic downturn. The chart shows how quickly the UK economy normally bounces back about 30 months after the onset of a recession. The only exception to the bounce back has been the current recession, where the economy has been flat after the 30 months point (the black line that is now horizontal).



Figure 2.1 Percentage change in GDP from previous recession in the UK

Source: NIESR (2013)

The recession which ran from 1973-75 is regarded as the first major recession since the ‘Great Depression’ of 1929 which preceded the Second World War. Prior to the 1973 there had been a period of world boom. The UK superimposed its own boom by a very expansionary budget in 1972 by the Conservative Chancellor at the time, Anthony Barber (Dow, 1999). Barber expected his Budget would add 10 per cent to the UK's growth in two years as he opted for rapid expansion of domestic demand, raised income tax and personal allowances, reduced purchase tax and increased government borrowing. This period of growth has since become known as the ‘Barber boom’. Unfortunately, events soon proved him wrong as the growth went into reverse. Due to the world boom, the global economy witnessed a rise in world commodity prices and an even steeper rise in world oil prices following the Organisation of the Petroleum Exporting Countries (OPEC) discovery of their monopoly power (Darby, 1982); both of which contributed to a rise in import prices. The consequences of this for the UK were a fall in the exchange rate, a sharp acceleration of inflation (17 per cent), a worsening in the terms of trade (real UK purchasing power) and a contraction in business and consumer spending (Dow, 1999). In response to this, the UK economy then went into recession between 1973 and 1975 with GDP falling by 3.3 per cent over the course of the two years (NIESR, 2013). The recovery from this recession differed considerably from that of its successors. At numerous points during the economic downturn, the economy attempted a recovery; however just at the point of expected economic growth, GDP fell more sharply than before. Figure 2.1 shows how this caused a ‘W’ shape in the trend in percentage change in GDP.

The next recession occurred between the years of 1979-83 and is associated with two major economic shocks. The first shock was the new rise in the world price of oil, which massively reduced consuming countries’ purchasing power by as much as the first oil shock in the last UK recession. By 1979, the UK was close to self-sufficiency in oil. However, North Sea oil was priced at the world price and its rise created large profits for the oil companies. The bulk of it was taxed away by the UK Government, and the revenue (it can be said) not spent (Dow, 1999).

For that reason, and also because North Sea oil at this point promised payments surpluses for future years, the exchange rate appreciated by 25 per cent during 1979 and 1980. Subsequently, the high exchange rate made exports less competitive, which in turn caused a reduction in UK exports. In addition, it is believed that the second shock was a result of internal political factors attributed to the new Conservative Government under Thatcher. Inflation had accelerated as a result of rising world commodity and oil prices; and with faster inflation, the growth of the money stock had again accelerated (Dow, 1999; Gregg and Wadsworth, 2010). Therefore, interest rates and taxes were increased in 1979 and in each of the next two budgets. The implications of these policy changes were the recession coming a year earlier than the rest of Europe, and a depression in demand as consumers witnessed a decrease in disposable income. The economy officially went into recession in 1979 and reached its trough in 1981. This recession was much deeper than the one before and the UK economy took far longer to recover. Unlike the recession of the mid 1970s, this recession formed a typical 'U' shape as the economy went through a phase of consistent negative growth and then recovered gradually over the three years (Figure 2.1).

The most recent recession to that of the current economic downturn was the period of negative growth between 1990 and 1993, known as the 'debt recession'. Unlike its predecessors, this recession appeared to owe nothing to exogenous shocks. The majority of literature argues that the cause of this recession was a massive collapse of confidence in the wider economy which had built up in the previous boom (Walsh, 1993; Taylor and Bradley, 1994; Dow, 1999). The boom of 1985-88 was synonymous with a turn to favourable terms of trade, rocketing house prices and increased business confidence, which fed on, and in turn contributed to, continuing rapid growth. During these three years of extremely rapid expansion, the saving ratio fell and investment rose strongly. Then, in October 1987, there was a stock market collapse of unprecedented size, even larger than that of 1929. Initially, this was handled well by the global economy as the stock market began to recover; however, the lumbering savings and loans industry was beginning to collapse in North America, leading to a savings and loan crisis which put the financial wellbeing of millions of Americans in jeopardy. When the boom broke in 1989, confidence collapsed and the excesses of the boom went into reverse; the saving ratio rose steeply, house prices dropped (Taylor and Bradley 1994), consumer spending fell (Walsh, 1993) and business investment contracted (Dow, 1999). The boom (hence also the subsequent recession) is sometimes also attributed to financial deregulation (Dow, 1999). Bank lending was decontrolled in mid-1980, which led to greater competition and growth in lending amongst banks and building societies. Therefore, the crisis in the US hit hard those countries most closely linked to the US, including the UK (similar to most recent recession). A short, mild recession was predicted by most forecasting models, however the increase in interest rates in

1989 and large changes in house prices had a substantial impact on aggregate consumption spending which caused the recession to loom longer and recover slowly (Taylor and Bradley, 1994). The recession was by no means as damaging as the previous one in 1980, however it was similar in the way the economy went into recession and subsequently recovered ('U' shaped). Furthermore, Gregg and Wadsworth (2010) demonstrate how it was similar to the current recession in terms of a deliberate policy of fiscal tightening to squeeze demand out of the system in order to get inflation on track.

2.3.2 The Labour Market

It is clear from the literature provided in the previous sub-section that the causes of major recessions in GB share a few similarities. They appear to be unpredictable and occur as a result of demand shocks, which in turn are amplified by swings in consumer and business confidence. As such the following sections draw comparisons on the impacts and consequences they have for the economy and the labour market.

Impacts on the Labour Force

Similarly to the 'Great Recession', unemployment has been a consistent factor of each of the last three major recessions in GB. However, Gregg and Wadsworth (2010) highlight that whilst the fall in GDP was markedly worse than in past recessions, both the loss of employment and the period over which employment fell was much smaller than in the past. Prior to the first major recession, the 1950s and 1960s saw a very low rate of unemployment (around 3 per cent on average) as a result of the 'post-war boom'. Technological advancements, a stable international trade environment, the success of Keynesian economics and the stability of the Phillips Curve (which postulated a relationship between high inflation and low unemployment) created a situation which approached full employment. Nevertheless, as mentioned in the previous section, the prolonged boom years collapsed in the 1970s due to the energy crises which had a huge impact on unemployment. Unemployment topped 1 million for the first time in January 1972. Despite the sudden rise, unemployment remained quite low from a historical perspective (Leaker, 2009). It was not until the 1980s where unemployment topped 3 million in 1982 (Green *et al.*, 1994). The 1982 figure of 3,081,000 represented 12.5 per cent of the working population, and in some parts of the country it was even higher (Leaker, 2009). For the duration of the early 1980s, unemployment rose further still until a slight respite towards the end of the decade. Even with the slight decrease in unemployment, the rates still remained above that of the recession in 1973-76. Therefore, it was not long before unemployment rose again in 1991, as the economy slipped into another recession. Unemployment peaked in 1993 at just less than 3 million. The figures help show how unemployment is highly cyclical, as it has historically increased during all three major recessions and recovered in between each of them.

It has already been established that unemployment burdens of a recession are not spread evenly across the population (Section 2.2.3). This, however, is not a new phenomenon. Historically, unemployment rates have been found to vary among different subgroups of the population in terms of sex, age, location, ethnic origin, disability status, qualification levels, parental status and previous occupation (Leaker, 2009). It is widely accepted in the literature that the 1980s and 1990s had a greater impact on male jobs. This is arguably a result of the decline in output within the manufacturing sector during the 1980s and the crashes in the housing market which slowed growth in the construction sector in the 1990s (Engemann and Howard, 2009). However, despite the larger proportion of males unemployed over the last three recessions, Moen (1979) argues that families headed by unemployed women during recession are more likely to suffer than those with a male breadwinner. Explanations from Moen (1979) from the 1970s recession include: unemployed women with young children can find the job search process problematic, and unemployed women at this time were less likely than men to have the training and experience that would make them more employable. This links into the argument made by Gordon (1999) who remonstrates that there is a general trend for the skilled to be more resilient to economic change. The low skilled are more likely to be ‘bumped down’ in response to reductions of demand, as the high skilled are able to perform low-skilled jobs, but not *vice versa* (Gordon, 1999) – something currently being observed.

In addition, age is an important determinant in the makeup of unemployment during a recession. It has been widely published that the current recession has impacted severely on the employment of people aged 16-25 in GB. This is by no means a new occurrence as the 1980s recession resulted in a large number of teenagers out of work (Townsend, 1983). Furthermore, there are also those amongst the literature who believe that those aged 55 years and over are often protected from recessions as some actually see an increase in employment during a downturn (Townsend, 1983; Engemann and Howard, 2009). For example, if people see devaluation in their retirement savings, they may elect to continue in employment and refrain from retiring, thereby suppressing the normal effect that the recession would have had. Household income is another important factor in determining the impact that a recession can have on people. For instance, between 1973 and 1975, all but the bottom earners took real income falls. In comparison, the middle income groups bore the brunt of the income falls in 1979-82, with those in the top income bracket taking a minimal loss in earnings (Goodman and Webb, 1995).

During recessionary periods, it also is typical for total hours to fall faster than employment. Overtime working is often cut first, some workers are placed on short-time working and others move into part-time work when they struggle to find full-time jobs. Hours did fall in this

recession, by around 2 per cent, but less so than in the past two recessions, especially during the 1980s when the Government subsidised short-time working in many major manufacturing plants and hours fell by around 4 per cent (Gregg and Wadsworth, 2010).

Industry Specific

Figure 2.2 highlights the change in output across the three different recessions for various industries. Plotting the change in GDP as a percentage of the previous year helps identify those industries which witnessed a decline in output as a result of each recession. First of all, because the 1973-75 recession was due to a sharp rise in oil prices, its impacts were largely confined to the coal industry. This is evident from Figure 2.2 as the mining and quarrying sectors were hit substantially. Output dropped by a staggering 15 per cent in this sector during the depths of the recession in 1973-74. Compared with the rest of the economy, the mining and quarrying industry also took the longest to recover as GDP continued to decrease until 1977. By this point, most of the other industries such as manufacturing, retail and retail had begun to show signs of growth.

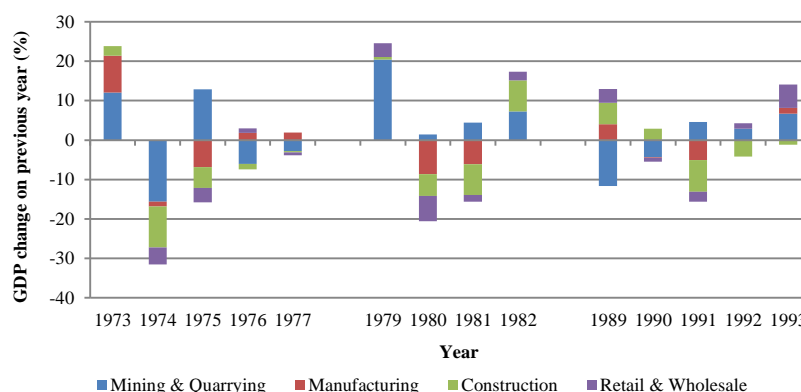


Figure 2.2 Percentage change in GDP on previous year by industry in the UK
Source: ONS (2010b)

Additionally, the intense recession and boom periods of the 1980s were also manifestly industrially uneven. Townsend (1982) argues that, economically, it was a turning point in the balance of production and employment, as the considerable amount of closures in the steel and motor industry were very damaging to the manufacturing sector. In fact, during the period 1979-82, the manufacturing industry recorded four years of consecutive negative growth, compared to the mining and quarrying sector which had four years of actual growth (Figure 2.2). Unlike the previous recession, the retail and wholesale sector suffered a little, a consequence of consumer confidence dropping. Finally, the 1991 recession also witnessed a varying degree of output across the industrial sectors. Unlike the previous recessions, this recession was in effect due to a collapse in confidence in the wider economy (Walsh, 1993; Taylor and Bradley, 1994; Dow, 1999). House prices had been on the rise for a number of years since the 1980s and went into

reverse during this recession. Therefore, it is unsurprising that the construction industry bore the brunt of the downturn, recording three years of successive negative growth (Taylor and Bradley, 1994). Moreover, the impact on the consumer confidence shock is evident between 1990-91 during the peak of the recession with the negative growth in retail and wholesale market. In this respect, the 2008–09 recession resembled the recession of the early 1980s, which was worst in manufacturing sector, rather than the service-led recession of the early 1990s (Martin, 1997; Martin and Tyler, 2000; Champion and Townsend, 2011).

2.3.3 Geography and Recession

Geographers and regional economists have long realised that the national economy is comprised of a set of regional and sub-regional economies (Green *et al.*, 1994). Therefore, considering regional economies can be heavily dominated by particular industries and local characteristics, it is appropriate to evaluate the geographical impacts that previous recessions have had across GB (Baddeley *et al.*, 1998). Section 2.3.4 has already explored the geographical nature of the recent recession. Nevertheless, as with many of the other topics up for discussion, past evidence proves this is not a new occurrence as UK regions have previously differed in their resilience to recessionary shocks (Fingleton *et al.*, 2012).

In general, the literature exemplifies that rural areas exhibit relatively less pronounced than average unemployment increases during recessions, but also display a tendency to have less than average levels of unemployment decreases (Green *et al.*, 1994). Furthermore, Townsend (1982) argues that during 1973-76, ‘peripheral regions’ suffered a higher than national rate of redundancy (principally areas in the primary sector). This feature distinguishes the period and explains why many coal mining towns in Yorkshire, and areas in the North East dominated by the steel industry, suffered increasing unemployment against the national trend. In comparison, at the opposite end of the urban hierarchy, recessions often resulted in the persistence of relatively high levels of unemployment in the large metropolitan areas (Green *et al.*, 1994).

Additionally, the magnitude of recession in the 1980s was sufficient to produce a clear change in the relative economic experience of different regions (Townsend, 1982). The 1980s recession caused enormous de-industrialisation and permanent job loss in the manufacturing sector with northern industrial Britain (West Midlands, North West, North East, South Yorkshire and Wales) witnessing an unprecedented amount of unemployment (Townsend, 1982; Audas and Mackay, 1997; Lee, 2012) – a spatial pattern which draws similarities with the recent recession. Through Geographical Information Systems (GIS) analysis, Green *et al.* (1994) are able to show how the return of recession in the 1990s was again associated with large spatial variations. Compared with the previous recession, the service sector was hit much harder which meant that

the South and East of the UK experienced more rapid unemployment increases than the northern and western areas (Green *et al.*, 1994; Evans and McCormick, 1994; Lee, 2012). This compressed the dispersion of regional unemployment towards that pertaining prior to 1979, such that in March 1993, 88 per cent of the labour force was located in regions with unemployment rates within 1 per cent of the national average (Evans and McCormick, 1994). North-South unemployment differentials diminished rapidly as the economy fell deeper and deeper into recession with the astonishing outcome that, by the end of 1992, the unemployment rate in the South East actually rose above that of Scotland for the first time since regional unemployment data became available in 1922 (Taylor and Bradley, 1994).

In conjunction, the timing of recessions can also be intrinsically different from one geographic area to the next. For example, it is believed that the North led the South (opposite to this time round) into the 1980s recession by a short period, and the South led the North into the 1990s recession with a longer time lag (Green *et al.*, 1994). More specifically, it is claimed that the West Midlands were the first of the regions to experience an upturn in unemployment in the 1980s recession. The North West and other Northern regions were next (following month), followed by East Anglia, the South West and South East (Taylor and Bradley, 1994). Based on this pattern of temporal diffusion, one would have expected a similar situation during the next recession in the early 1990s. However, history refused to repeat itself. Having been last to enter and first to exit the first recession, the South East was the second region (after East Anglia) to experience an upturn in unemployment this time round (Carruth and Henley, 1992) – followed by the South West (in February 1990), the East Midlands (March 1990) and the West Midlands (May 1990) (Green *et al.*, 1994; Lee, 2012). Some urban-rural contrasts were also evident. In the South and Scotland, rural areas appeared to have responded later than urban areas, while this pattern was reversed in the remainder of the North. In general, however, intra-regional variations in the 1990s were less marked than was the case in the first recession. This is perhaps a feature indicative of the convergence in local industrial structures over the period and of the increasing salience of local linkages at the sub-regional and regional scales (Green *et al.*, 1994).

2.3.4 Consumers and the Retail Market

General Theories of Consumer Behaviour

Traditional consumer theory and models refer to the consumer as a rational self-interested being and thus do not consider ethical and altruistic consumer motives (Bondy and Talwar, 2011). Therefore, during a recession or period of economic downturn, consumers are expected to alter their purchasing patterns as they become more aware of the price of goods. This is explained by the Theory of Buyer Behaviour (TBB) which states that as consumer's confidence in the

economic outlook weakens, they tend to become more price conscious as they weigh price more heavily within their purchase decisions (Howard and Sheth, 1969). This line of thought is consistent with a study by Estelami *et al.* (2001) which discovered that as an economy shrinks, consumers increase their price knowledge. This has been witnessed in the current recession as people are constantly searching for the best prices. TBB also stipulates that product preferences may change as well, which can last long after the recession ends (Howard and Sheth, 1969). This is especially pertinent within grocery products, as consumers do not have the option to hold-off purchases and must get the best value possible (Bondy and Talwar, 2011). During normal economic times, price may not be the most influential product variable in a consumer's decision process; during a recession, price is likely to become more influential for mainstream products as consumers change their consumption patterns in an attempt to maintain the same food value with more limited funds (Howard and Sheth, 1969). Interestingly, however, Bondy and Talwar (2011) found in their research that certain consumers were unaffected by the troubles in the global economy as they continued their traditional food shopping behaviour, revealing in particular that their ethical convictions could not be shaken. Thus, in this instance, the TBB is unable to explain the motives and behaviour of consumers during economic downswings. The recommendation is that further research pertaining to consumers and their characteristics is required for current consumer theory to develop and incorporate the motives of different consumers.

Consumer Behaviour in Previous Recessions

Since 1970, Pain and Weale (2001) demonstrate through general time-series analysis that, historically, there has been a general tendency for both consumer confidence and consumption to be weaker at times of subdued growth (recession) and stronger during times of expansion within the economy. This is because, during times of economic uncertainty, consumer behaviour has a dominant influence on the state of the economy (Blood and Philip, 1995). Gjerstad and Smith (2010) also stress that in order to gain a genuine understanding of economic fluctuations (e.g. recession), one must recognize the basic facts of household expenditure cycles. The various explanations for a reduction in consumption and expenditure include unemployment, negative media coverage (fear and uncertainty) and a shortage of accessible credit (Pain and Weale, 2001). Unemployment, in particular, is of crucial importance, because not only does it impact upon the consumption of those who have lost their jobs, it also has a contagious effect on the people around them. For instance, people who are still in work, but have seen a friend, family member or colleague lose their job, are also likely to reign in their spending, fearing they may be next (Flatters, 2008). In addition, fluctuations in housing wealth and credit rationing are also a couple of the major reasons to have caused a variation in household consumption spending during past recessions (Evans and McCormick, 1994). As

interest rates rise during a recession, the increase in spending by depositors may not equal the reduced spending of borrowers.).

In recession, consumers not only feel insecure in their job and negotiate more about financial matters (Shama, 1978); they also adapt their shopping behavior and habits in response to the changing economic conditions (Ang *et al.*, 2000; Ang, 2001; Zurawicki and Braidot, 2005). For instance, Le and Nhu (2009) argue that, in the 1980s recession, consumers spent more time on comparative shopping. Moreover, during the UK 1990-93 recession, real sales (inflation-adjusted) by fast-food/quick-service places, restaurants and lunchrooms, lodging places, retail hosts and recreation and entertainment places were sluggish as people ate out less often and kept a sharp eye on menu prices (Flatters, 2008). Moreover, the per capita consumption of alcohol also fell by 11 per cent in the UK recession between 1979 and 1982 (Kendell, 1984). Recessions also have the power to accelerate and derail consumer trends. For example, the relative decline of beer and spirits was already underway by the time the 1990s recession hit. Nevertheless, the recession seemed to accelerate the trend and make things worse. In contrast, spending on wine, which had been growing, held up relatively well (Flatters, 2008). Perhaps the most important lesson from the literature is that it is dangerous to generalise about consumers' experience of recession. Different groups are impacted differently depending on their age, gender, income, marital status, family size and geographic location (Ang, 2001; Zurawicki and Braidot, 2005). However, there is an important distinction to be made between those who have no choice but to cut back and those who cut back because of reduced confidence. Indeed, the 1990s recession was the making of some markets that involved small, self-contained, luxurious treats (Flatters, 2008). Even though many were cutting back in most areas, these markets benefited from people promoting the feeling that life has to be worth living.

In addition, consumer spending across all categories has often held up reasonably well in the first few quarters of previous economic downturns. This makes perfect sense. At first people are not sure if there will be a recession and then they are not certain about how deep or sustained it will be. The 1990s recession only began to bite into consumer spending when consumers became clear that the recession was for real (Flatters, 2008). This illustrates two important points about consumer behaviour and recessions. First, recessions can get off to a slow start, and second, recessions can have a long tail. The second point is hugely important with regards to economic recovery. This is because recessions can create an extended, depressing effect on consumer spending, lasting long after the 'official' end of a recession (defined by when GDP starts to grow again). This was evident in the 1990s recession, because even though it officially ended in 1992, consumer confidence was still decreasing in 1995 (Pain and Weale, 2001).

The Impact on Retailers

In response to the reduction in consumer confidence and shifts in behaviour, companies are forced to develop strategies to stimulate consumer demand. Evidence from previous recessions show that the most common include: a redefinition of the target customers, narrowing the product line, offering cheaper products and quantity discounts, lowering prices, increasing promotion, reducing investment, entering foreign markets and improving efficiency (Sharma, 1978; Le and Nhu, 2009).

Nevertheless, the fact still remains that during times of recession some businesses survive and thrive as others struggle and fail. For example, whilst the 1979-83 recession decimated the manufacturing sector, the subsequent consumer-led recovery which followed actually benefited retailers hugely (Wrigley and Lowe, 2002). Furthermore, in what was a deep service and property-led recession (1990-93), domestic and commercial property values fell precipitously in both real and absolute terms between 1989 and 1991 (Wrigley, 1994). Consequently, having invested heavily in new-store investment programmes the decline in property values meant a large proportion of the land that new stores were built on was now worth much less than when it was originally purchased which contributed to Tesco recording a fall in profits of 22 per cent between 1992 and 1993. Asda too also recorded losses which Duke (1993) states were accredited to the financial pressures associated with the 1989 to 1991 recession. Conversely, the economic conditions of the recession also helped play a major role in providing opportunities for market entry for European discount retailers Netto, Aldi and Lidl (Hogarth-Scott and Rice, 1994). The recession created a number of favourable opportunities for trading (expanded upon in Chapter 3). During this time, there was a clear level of polarization between consumers with increased disposable income and those such as the unemployed and single parent households (Burt and Sparks, 1994; Hogarth-Scott and Rice, 1994). Whilst companies such as Marks and Spencer targeted the more affluent consumers, the deep discounters were able to target those customers with much lower levels of income at the bottom end of the market.

2.4 Conclusion

This chapter has attempted to provide a comprehensive and up-to-date account of the workings of the economic downturn. Initially, considerations were given to the evolution of the recession, addressing the role of the financial crisis and the interconnectedness of the global economy. Next, the various impacts of the recession were addressed, illustrating the strains on the UK housing market, construction, manufacturing and the retail sector. The sharp decline in consumer confidence was also discussed, specifically in relation to a documented shift in traditional patterns of consumption and expenditure behaviour. The evidence suggests that

people are staying in more and eating out less, spending more on own-brand products, shifting to discount retailing (especially the grocery market). Nevertheless, there were also found to be a number of conflicting arguments raising the support for a more detailed and comprehensive analysis of the recessions impacts on both consumers and retailers. Additionally, from a geographical perspective, whilst there has been some descriptive analysis of patterns of unemployment in GB's urban areas, no analysis has yet investigated the underlying influences of the recession at a more sub-regional and local level, especially in the context of the retail market and household expenditure. In terms of past recessions, Section 2.3 explored more general theories of recession and identified number similarities between the current economic downturn and those of the past – emphasising a number of possible research questions and avenues for study. For example, in the context of the grocery market, the literature indicates that the discount market is benefiting once more from households trading down, However, it remains to be seen whether the polarisation effect of consumers trading up to premium ranges will also surface as it did back then.

Whilst the economic downturn continues to grab headlines, any changes in consumer behaviour are constantly attributed to the harsh economic environment. Therefore, it is important to explore and identify the long-term structural trends in society and the retail market. Consequently, this area will be explored in more detail in Chapter 3 so that actual recessionary trends can be separated from those deemed non-recessionary or long-term. This will ensure that any conclusions made in the subsequent analysis chapters are built on a complete understanding of consumer behaviour in the food retail market and the recession.

Chapter 3

Understanding Trends in the British Food Retail Sector

3.1 Introduction

In Chapter 2, an in-depth historical analysis of Britain in recession since the Second World War was presented. Particular attention was given to the origin, development and impact of the most recent recession in an attempt to provide context and focus for the research in the subsequent chapters. Nevertheless, little consideration was given to the long-term trends which are continuously impacting upon consumer demand and the major structural changes that have shaped the food-retail market over the last 30 to 40 years. Consumer preferences, their choices and their behaviour fundamentally influence the way in which the retail landscape evolves. It is therefore essential to know how consumer characteristics have changed in the past, how they are likely to change over the next few years and what strategies retailers have developed to exploit this change. As a result, what follows in this chapter is a historical review of the non-recessionary trends (demand and supply) which have come to shape the contemporary grocery market we see today. This will be crucial for subsequent research in the thesis, for it will be important to disentangle those trends that are not associated with the economic downturn – and, in doing so, provide a more holistic examination of the British grocery market in recession.

The chapter will be split into two sections. First of all, Section 3.2 will examine the literature surrounding consumer expenditure in the retail sector and the various factors which drive expenditure. Initially, attention will be given to specific theories of household consumption and the geographies of consumption. This will be followed by an examination of general patterns in household expenditure, with particular attention focused upon the food retail market. The remaining parts of Section 3.2 will then highlight the literature commenting on the demographic, socioeconomic, cultural and geographic drivers of expenditure. In conjunction, Section 3.3 will reflect upon the key drivers of, or barriers to, retail development along with the structural changes that have occurred in the retail grocery market over the last 40 years. Although this part of the literature review is somewhat chronological and descriptive in nature,

a number of theories and statements will be challenged and reflected upon over the course of the chapter. More specifically, there will be a discussion of retail change from the 1960s to the beginning of the 1990s (the ‘golden age’ of grocery retailing Wrigley, 1987)), the response by retailers to the end of the ‘golden age’, and finally, the ‘post-property crisis’ and food retailing in the early 2000s – an important phase in retailing which has become associated with increased anxiety over market saturation (Hughes *et al.*, 2009) and adaptation by British retailers (Burt *et al.*, 2008).

3.2 Understanding Consumer Demand

Understanding changes in household consumption expenditure patterns are about understanding human behaviour. Why do we consume and what drives our behaviour to buy specific products and services? However, patterns of expenditure are complicated, for they are shaped and reshaped by an array of interdependent demographic (Langston *et al.*, 1997; Solgaard and Hansen, 2003; Druckman *et al.*, 2008), socioeconomic (Solgaard and Hansen, 2003; Evans, 2008; Kohijoki, 2011), geographic (Birkin *et al.*, 2002; Wrigley, 2002; Khawaldah, 2012) and cultural distinctions (Rozin *et al.*, 1986; Jackson *et al.*, 2005; Lazaridis and Drichoutis, 2005). Consequently, what follows is an exploration of the relevant literature surrounding the major theories and drivers of consumer demand, particularly in the food retail market.

3.2.1 Theories of Consumption Expenditure

One of the earliest theories regarding the consumption expenditure paradigm is Keynes’ General Theory. Often considered to be the origin of macroeconomics, Keynes’ basic model states that current consumption expenditures are determined mainly by current disposable income. More specifically, it is a psychological law that households increase their consumption as their income increases, but not by as much as the increase in their incomes (Keynes, 1936). The ratio of consumption to income was termed the Average Propensity to Consume (APC) and the rate at which consumers increase demand as income rises was termed the Marginal Propensity to Consume (MPC). The theory is also related to the absolute income hypothesis, whereby individuals view their income and financial position in absolute terms. Nevertheless, whilst Keynes’ theory of saving is generally accepted, it is argued to be an insufficient and overly simplistic view of consumption expenditure. For instance, in 1942, Simon Kuznets pointed out a paradox that could not be explained by Keynes’ (1936) linear consumption function – the percentage of disposable income that is consumed is remarkably constant in the long run, and therefore does not necessarily increase with income (Jappelli and Pistaferri, 2010).

The contradiction identified by Keynes (1936) became the object of a number of studies. For example, the relative-income hypothesis was put forward by Duesenberry (1949) that was comprised of two variants. The first, described as the time-series variant asserts that a household's consumption depends not only on its current disposable income, but also on current income relative to past levels (Dusenberry, 1949). Thus, when incomes fall, consumption would not fall in proportion. Additionally, the cross-sectional variant states that a household's consumption depends not just on its own current level of income, but on its income relative to those in the subgroup of the population with which it identifies itself. For example, households with lower income within the group will consume a larger share of their income to 'keep up', while households with high incomes relative to the group will save more and consume less (Parker, 2010). However, whilst this theory enjoyed considerable popularity in the 1950s, it is understood that the relative-income theory is not discussed much anymore. Commentators suggest that this abandonment resulted partially, if not mostly, from the development of other, more attractive consumption models (Parker, 2010). These are discussed below.

For instance, the life-cycle model was proposed by Modigliani and Brumberg (1954) and then later expanded upon in Modigliani and Brumberg (1980). The life-cycle hypothesis derives from the simple idea that, in early life, labour income is usually low relative to later working years. Income typically peaks in the last part of the working life, then drops at retirement (Deaton, 2005). Therefore, consumers who wish to smooth consumption would prefer to borrow during the early low-income years, repay those loans and build up wealth during the high-income years, then spend off the accrued savings during retirement. Implicit in the life-cycle approach is the idea of a lifetime budget constraint that links consumption at various dates during the lifetime (Parker, 2010). Nevertheless, critics have argued that the elderly in fact do not dispose of their assets in the way that the theory requires and indeed that many of the elderly appear to save part of their incomes (Banks *et al.*, 1998). Whilst there have been many challenges to this theory of consumption through the years, the life-cycle hypothesis still remains an essential part of economists' thinking (Deaton, 2005).

In relation to the life-cycle hypothesis, Friedman (1957) discussed the general problem faced by households when their income fluctuates over time, whether due to life-cycle effects, business cycles or other factors. The theory considered infinite-lived households and distinguished between a level of income that they expect over their lives, which he called permanent income, and (positive or negative) deviations from that level, termed transitory income (Hall, 1978; Campbell, 1987; Wang, 2006). Similarly, Friedman distinguished permanent consumption, which is the part of consumption that is planned and steady, from unexpected or irregular spending or transitory consumption (Friedman, 1957). The argument is that permanent

consumption will be proportional to permanent income. Households will plan to spend in an average period a fraction (equal to one or slightly less) of their average lifetime income. Nevertheless, due to their similar nature, contemporary literature would suggest that the life-cycle hypothesis and the permanent-income hypothesis have largely merged to become modern consumption theory (Deaton, 2005).

Although many of the primary theories on consumption provide an economic insight into theories of consumption, little is mentioned regarding the geography of retail consumption. Retail geography has now come to occupy a central position within social scientific research. Some commentators have gone so far as to suggest that the spaces, places and practices of consumption, circulation and exchange lie at the very heart of a reconstructed economic geography (Crang, 1997). Furthermore, an important aspect of contemporary geography is the drive to understand and set consumption in a more powerful theoretical framework – part of the so-called ‘new retail geography’ (reviewed by Crewe, 2000; Lowe and Wrigley, 1996; Wrigley and Lowe, 2002). Geographers are moving away from traditional concerns focused solely on retail location and sales performance, built primarily on Newton’s theory of Universal Gravitation. Examples included Reilly’s (1931: cited in Foot, 1981) Law of Retail Gravitation, Converse’s (1949) revision and ‘breaking-point model’, Huff’s (1964) model of ‘trade area attraction’, Christaller’s (1933) Central Place Theory and Wilson’s (1971) ‘family’ of Spatial Interaction Models (SIM) (see Chapter 7). Instead, the focus has now become the wider theoretical perspectives on consumption spaces and commercial culture (Wrigley and Lowe, 1996; Jackson *et al.*, 2005). However, whilst there is no doubt that this ‘new retail geography’ is theoretically well informed and an extremely important development. There is clearly no place in this retail geography agenda for the traditional concerns with store location research – specifically Geographical Information Systems (GIS) and statistical models. Birkin *et al.* (2002) recognise this as a drawback, for the techniques used in handling store location issues and consumer preferences have developed rapidly over the years, and there are as many theoretical developments in this area as there are in cultural and economic geography (Longley *et al.*, 2001; Fotheringham *et al.*, 2002; Birkin *et al.*, 2010; Reynolds and Wood, 2010). The details of these methods and their theoretical grounding will not be discussed at this point; however, further explanation of these models will be provided in Chapter 7 – reinforcing the argument that there should in fact be a place for this line of research in retail geography.

3.2.2 Household Expenditure

Building on the more general theories of consumption expenditure, a number of authors discuss the structure of UK household expenditure (Birkin *et al.*, 2002; Duffy, 2003; Attfield, 2005;

Druckman *et al.*, 2008; Jackson and Papathanasopoulou, 2008; Chitnis and Hunt, 2011; Diaz-Mendez and Garcia-Espejo, 2012), whilst others provide a more international context (Lanfranco *et al.*, 2002; Karagiannis and Velentzas, 2004; Selvanathan and Selvanathan, 2004; EEA, 2005). With regard to the United Kingdom (UK), total real household expenditure (at 2003 prices) increased almost threefold from £251 million in 1964 to £720 million in 2005 (Chitnis and Hunt, 2011), accounting for approximately 60 per cent of total domestic expenditure (Jackson and Papathanasopoulou, 2008). The main trend has been a decline in the percentage share of expenditure on food, fuel and power and clothing and footwear as households are spending more on leisure and retailing activities (Birkin *et al.*, 2002; EEA, 2005; Jackson and Papathanasopoulou, 2008). Specifically on food, in 1968, the money spent on the purchase of food and eating was split between (domestic) food expenditure 80 per cent and catering (eating out) expenditure 20 per cent. By 2000, Jackson and Papathanasopoulou (2008) indicate the balance of expenditure between home eating and catering was actually 47 per cent to 53 per cent respectively – suggesting that people now spend more money on eating out than they do on eating at home. Synonymous with this has also been a marked change in the consumption of different food types. Per capita consumption of potatoes, milk and bovine (red) meat has declined significantly, while that of fruit and vegetables, pork and poultry meat (arguably due to rising incomes), fish and seafood, and cheese has increased (EEA, 2005).

3.2.3 Demographic Drivers of Expenditure

In order to understand the patterns of household expenditure over time, a number of commentators discuss the importance of demographic factors that are seen to determine household expenditure (Solgaard and Hansen, 2003; Druckman *et al.*, 2008; (Jackson and Papathanasopoulou, 2008; Sands *et al.*, 2009; Chitnis and Hunt, 2011; Angell *et al.*, 2012). In the context of the grocery market, one factor in particular that has a large influence on the level of expenditure is the population or, more importantly, population change. For example, the global population is increasing year-on-year and is estimated to be around 7 billion (USCB, 2012). This puts increasing pressure on food production as demand across the world increases. In the context of the UK, data from the 2001 and 2011 Censuses would suggest that the UK population has increased at a steady rate over the last ten years (ONS, 2012c). Moreover, it is expected that after 2011, the UK population will continue to rise, although at a far more rapid pace. For instance, the UK population is expected to grow to 71 million people by 2031 (ONS, 2012c). This will undoubtedly have an impact on the levels of household expenditure across the UK, for an increase in population will surely amplify demand in areas of high growth – something which will undoubtedly benefit the grocery retailers (Birkin *et al.*, 2002).

Age

In addition to increased population growth, the demographic make-up of the UK population is also changing. For example, population ageing has become a major feature in human society and has generated much academic discussion (Biggs and Powell, 2001; Christensen et al., 2008; Cook and Hallsall, 2012) – as age plays an important role in determining the level of expenditure on food (Goodwin and McElwee, 1999; Birkin *et al.*, 2002). This undoubtedly has implications for grocery retailers, as they are faced with the challenge of catering for the increasing numbers of elderly customers (Kohijoki, 2011). In the UK, the ONS reported that the proportion of the population aged 16 and under had dropped from 25 per cent from 1971 to 19 per cent in 2008 (ONS, 2010c). At the same time, the proportion aged 65 and over has risen to 16 per cent compared to 13 per cent in 1971. This population trend is projected to continue, and by 2031, 22 per cent of the population will be aged 65 and over (ONS, 2010c). On the one hand, the continuing increase in the older generation represents a significant marketing opportunity for the British grocery industry, with those aged 50 and over making up 34 per cent of the population, 51 per cent of grocery spend, and 80 per cent of disposable income (IGD, 2010). However, it could be argued that a continued ageing population has created a disadvantaged consumer group with regards to grocery shopping (Bromley and Thomas, 1995; Hare, 2003; Meneely *et al.*, 2009). The elderly, especially those who are without care, are disabled or/and have limited mobility, have emerged as the ones who suffer from the closing down of stores in their neighbourhoods (Wilson *et al.*, 2004; Kohijoki, 2011).

In contrast, Christensen *et al.* (2008) suggest that in fact the ageing process is modifiable and that people are living longer without severe disability. Kohijoki (2011) reinforces this point and notes that the elderly have not experienced significant difficulties in accessibility. Instead, as consumer's age, they demand more high-quality products and services and they are willing to make an effort to satisfy their needs. The literature would suggest that elderly shoppers are rational, price conscious, service oriented, store loyal and prefer own-label goods (IGD, 2010; Kohijoki, 2011). Moreover, they also do their grocery shopping mostly in supermarkets located near their homes, shop for the purpose of social interaction, exercise and recreation and are aware of the importance of healthy food (Leighton and Seaman, 1997; Goodwin and McElwee, 1999; Whelan *et al.*, 2002; Wilson *et al.*, 2004). Field (1997) also comments on the strength of the 'grey market', pointing out it has an income 8 per cent higher on average than the rest of the population.

In conjunction, since the rise of e-commerce, much of the recent literature regarding grocery expenditure has concentrated on the impact of age as a discriminator for selected shopping channels (Weltreveden, 2007; Kohijoki, 2011). Today, most young people access the internet

on a regular basis; 98.7 per cent of 16-24 year olds have used the internet compared to only 23.8 per cent of those aged 75 (ONS, 2012c). The reason for the low uptake in older consumers is argued to be because for elderly shoppers, the internet is not regarded as a very pleasant way to do grocery shopping. Moreover, the physical exercise and social aspect of shopping are more important (Kohijoki, 2011). Wilson-Jeanselme and Reynolds (2005) provide a more theoretical framework for understanding demographic variations in the use of e-commerce for shopping. The major purchasing criteria are identified as time, quality and cost, and it is argued that consumer attitudes may be separated into five groups. For example, for groups which are 'cost conscious' (the elderly), it might be expected that internet retailers could find it more difficult to compete (especially in relation to e-grocery where distribution costs are typically additional) than for those who are 'time conscious' (e.g. those with young families).

Gender

In addition to age, gender also has the ability to sustain and transform consumer behaviour (Crowe, 2000). This is because grocery shopping is still frequently considered to be the responsibility of the female spouse (Piper and Capella, 1993; Little, 2009). However, modern social and demographic movements are causing changes to traditional gender roles. There is now a greater acceptance of working mothers and women now have greater access to higher incomes due to professional occupations and improved education (Lazaridis and Drichoutis, 2005). A growth in the number of women in employment has also contributed towards the trend for more convenience in recent decades, with an increasing focus on impulse, out-of-home and on-the-go consumption (Lazaridis and Drichoutis, 2005). These consequential changes within the family unit means more men now engage in grocery shopping as a voluntary or necessary task (Richbell and Kite 2007). Yet, while regular food shopping by men is on the rise, the examination of male shopper types remains limited. Nevertheless, studies show that male supermarket shoppers are not homogeneous and that different groups exist. For example, Piper and Capella (1993) found that regular male grocery shoppers are likely to be employed in white-collar, professional occupations with high levels of education and income. Moreover, empirical evidence would suggest that men rarely comparison shop and thus place less importance on product evaluative criteria (Reid and Brown, 1996; Williams, 2002). Interestingly, variations in e-purchasing patterns are also structured by gender, as males are consistently more likely to patronise the internet than females (Weltreveden, 2007) – possibly reflecting the increased value attached by men to (reduction in) time spent shopping, or perhaps a lower emphasis on quality.

Ethnicity

Other internal population changes which are driving household expenditure include the increased immigration into the UK over recent decades, creating a progressively diverse ethnic composition. This has led to cultural variations in attitudes to food, eating, shopping and cooking, bringing greater complexity to overall consumer demands and consumption trends (Jamal, 2005; Goldman and Hino, 2005). It is believed that certain ethnic groups have a tendency to purchase food items in traditional outlets rather than supermarkets. The main reasons are seen to be the geographical diffusion barrier (distance of supermarket formats) and underlying cultural factors such as social interactions and being part of an informal economy (Goldman and Hino, 2005). The ethnic food market in Britain was worth an estimated £208 million in 2008 (growth of 11 per cent between 2007 and 2008), according to the market research company Mintel (BBC, 2009). The increased exposure to new cultures has also broadened the horizons of the existing population who want to experience new cuisines (EEA, 2005). Increased immigration will continue to provide opportunities for meeting a diverse range of needs. As well as the needs of the immigrant population themselves, these trends will impact the mainstream food culture of the country for many years to come. Goldman and Hino (2005) recognise this and stress that researchers should continue to explore the impact of cultural and ethnic factors on shopping behaviour and make these variables an integral part of their research agenda.

Household Size

Regarding household size, large households are found to spend more on grocery expenditure in the UK, because there are more chances to have different tastes and needs and thus exhibit more variety seeking behaviour (Martinez-Carabello et al., 2011). However, it is also possible that larger households have less time to go shopping and tend to concentrate their purchases in one store (Mägi, 2003). The same could be said for single- person households, as people with less free time (due to employment commitments) will concentrate their purchases in a limited number of stores in order to spend less time and effort on shopping (McGoldrick and André, 1997). The role of single-person households especially has become an important factor driving consumer behaviour in recent years. Throughout Europe, the average household size is declining at quite a rapid rate due to increasing divorce rates, a rise in the number of single occupants, co-habiting non-married couples and more people delaying marriage until later in life (Birkin *et al.*, 2002). The number of single-person households is set to increase further, as it is projected that the number of one-person households in England will increase by 60 per cent to nearly 11 million households in 2031 (ONS, 2012c). From a retailing perspective, the implications of these changes are interesting – demand for smaller convenient portion sizes will

increase and convenience options will continue to be important for those who do not want to cook a meal just for themselves (IGD, 2010). Furthermore, the decrease in average household size will impact shoppers' needs, including smaller pack sizes, ready-prepared food and eating out. It may also reduce the incidence of people eating formal meals and increase the likelihood of people eating snacks and smaller meals throughout the day.

3.2.4 Socioeconomic and Geographic Drivers of Expenditure

In addition to demographic factors driving demand, there are also a number of socioeconomic components which affect consumer behaviour. At an aggregate level, in line with households spending less of their overall household budget on domestic food, the price of food is rising at a rapid pace. In 2006, the Food and Agricultural Organisation (FAO) food price index rose by an average of 9 per cent compared with the previous year, and by 2007, that figure had increased to 23 per cent (Evans, 2008). This trend is supported the World Bank, which state global food prices increased by 83 per cent between 2003 and 2008, and that food production will need to grow by another 50 per cent by 2030 to fulfil projected demand (cited in Borger, 2008). Those factors contributing to rising food prices are believed to be rapidly rising income growth, notably in emerging economies such as China and India (Wiggins and Blas, 2007), the role of biofuels as a source of demand for grain (Evans, 2008) and the costs of agricultural inputs (especially energy) are also rising (EEA, 2005). Other issues which are believed to become more pressing overtime include water scarcity and climate change. Evans (2008) notes that global demand for water has tripled in the last 50 years and climate change. With regard to climate change, the International Panel on Climate Change (IPCC) projects that global food production could rise if local average temperatures increase by between 1 and 3 degrees Celsius, but could decrease above this range (cited in Evans, 2008).

Income

At the individual/household level, income is the crucial factor that drives expenditure (Rozin *et al.*, 1986; Fischer, 2005; Kohijoki, 2011). Income is correlated with expenditure in the sense that higher income consumers spend more on food and have a stronger preference for premium line products (Fischer, 2005). Lazaridis and Drichoutis, (2005) point out that one way to think about food consumers and income is through Maslow's (1943) hierarchy of needs. People at lower income levels want firstly to satisfy their physiological needs for food based on the food preferences of their culture. Then, when income levels increase and consumers gain affluence – they move higher on the pyramid and their attention turns to the quality of food they eat. Consumers then demand foods that are safe or that promote good health and become more concerned about food safety, like pathogens and disease risks (attitudes to food will be

expended upon in section 3.4.5). However, there are several problems with the Maslow's (1943) model when real-life working practice is considered. For example, as already discussed, individual behaviour responds to several needs (not just income) and the model ignores the often-observed behaviour of individuals who tolerate low-pay for the promise of future benefits. Furthermore, when linking back to the argument in Section 3.2.3 about ageing populations, even though the elderly have been found to constitute a significant group of low income earners – the elderly are still economically significant consumers as their disposable income is relatively substantial and they tend to spend a high proportion of it on food (Leighton and Seaman, 1997; Kohijoki, 2011). Households with lower incomes have also been shown to demonstrate sophisticated strategies for 'economic' shopping, utilising a wide range of store types including markets, discount stores, supermarkets and convenience stores to buy the food they need to feed their families from one payday to the next (Williams *et al.*, 2001).

Mobility and Accessibility

In conjunction, mobility also plays an important role in driving consumption expenditure patterns; no more so than in the grocery market. In the context of mobility, globalisation has led to increased access to goods and services from all over the world, which in turn has caused a growth in grocery expenditure (EEA, 2005; Jackson, and Papathanasopoulou, 2008). There have been claims that globalisation stems the 'end of geography' (O'Brien, 1992), as it acts as a planetary force, capable of penetrating all kinds of national boundaries and eroding any geographical differences therein. However, there is limited evidence within the literature to suggest that the globalisation of retailing and consumption is or will eliminate differences between places – for the globalisation of retailing continues to weave complex interdependencies between geographically distant locations and tends towards global interconnection and differentiation (Wrigley and Lowe, 2002).

Another factor influencing mobility is the rising levels of car ownership in society. In the UK this has meant that individuals are spending more time travelling, both to work and to shop (Birkin *et al.*, 2002). By 2015, the Department of Transport (DOT) predicts there will be 32 million cars on the road in the UK (cited in Birkin *et al.*, 2002). It is therefore difficult to envisage anything other than continued growth as consumers strive to undertake linked and multipurpose trips (Goldman and Hino, 2005). Increasing economic mobility of consumers over the last 20 to 30 years has also led to the growth of out-of-town retail developments (Birkin *et al.*, 2002; Clarke *et al.*, 2006; Jackson and Papathanasopoulou, 2008) as retailers attempt to take advantage of potentially larger store catchments. Others argue, however, that the move to larger out-of-town stores formats has had a negative impact on those with limited mobility and thus their accessibility to food stores. This has already been addressed to some extent through the

discussion regarding the UK's ageing population. However, poor accessibility to food stores is also associated with lower socioeconomic groups; consumers with low income and/or restricted mobility are known to have poor access to food stores (Whelan *et al.*, 2002; Wilson *et al.*, 2004; Khawaldah, 2012). Therefore, more deprived consumers are found to be dependent on grocery stores close to their home, and subsequently suffer the most from the closing down of a local high street store (e.g. Bromley and Thomas, 1995; Whelan *et al.*, 2002; Kohijoki, 2008). In the literature, areas which are deprived suffer from social exclusion and have poor access to the provision of healthy, affordable food have been termed 'food deserts' (Beaumont *et al.*, 1995). In these 'food deserts', cheap, fresh, and nutritious food is virtually unobtainable, as car-less residents are unable to reach out-of-town supermarkets. The 'food desert' debate is also linked to the relationship between accessibility to food stores and obesity. For instance, Cummins *et al.* (2005) found that McDonald's fast-food restaurants were more likely to be found in more deprived areas in England and Scotland.

Geography

In terms of studying the geography of grocery expenditure in Britain, the literature is lacking somewhat with regards to detailed studies. For instance, only Langston *et al.* (1997, 1998) and Poole *et al.* (2002) provide a comprehensive geographic picture of grocery expenditure. However, even these have some drawbacks, as both methodologies involve applying average expenditure values for different socioeconomic groups to postal area population counts (top-down approach). Furthermore, there are no real in-depth studies of customer patronage for different retailers at any geographic scale beyond the region level. Instead, much of the research is concentrated on the share of retail floorspace as a proxy for local market share, something which will be discussed in Section 3.3. Instead, much of the work has concentrated on trying to understand the difference between urban and rural consumers (Little *et al.*, 2009; Khawaldah, 2012). As might be expected, in general, consumers in more rural areas tend to travel further distances to reach a food store, travel more infrequently and are likely to spend more on a weekly food shop (to save coming back again). Cullen and Kingston (2009) also suggest urban consumers are more responsive towards new food products and rural consumers place great importance on quality, taste, health issues and nutritional composition. In addition, whilst not directly related to the urban/rural debate, tourist areas and holiday locations in the UK are shown to also have an impact on grocery demand. Dudding and Ryan (2000) note that in many holiday destinations, tourists will complement revenue derived from residents for a range of retailers such as supermarkets and local convenience stores. Newing *et al.* (2013) support this point and suggest that, for stores in popular resorts, visitor spend can represent over half the weekly recorded.

There is also a growing debate surrounding the relationship between geography and the various channels used to purchase goods (summarised by De Blasio, 2008). Cairncross (1997) for example, argued that e-commerce would bring about the ‘death of geography’ – as shoppers no longer need to travel to physical stores. However, others argue that there are interesting rural/urban differences in usage and in short, geography seems to matter for e-shopping (Farag *et al.*, 2006; Lennon *et al.*, 2007). For instance, it has been documented that e-commerce is in fact predominantly an urban phenomenon, because new technology usually starts in centres of innovation (innovation-diffusion hypothesis; see Farag *et al.*, 2006). Conversely, Farag *et al.* (2006) states that consumers are more likely to adopt e-commerce when their accessibility to physical shops is relatively low (efficiency hypothesis). Therefore, rural consumers that face greater accessibility problems in relation to physical stores may thus find e-commerce and home delivery more convenient and accessible (Lennon *et al.*, 2007). It could also be argued that the ‘efficiency’ hypothesis may also be applicable to areas of cities which lack good access to retail facilities, linking back to the ‘food desert’ discussion (Wrigley, 2002; Clarke *et al.*, 2002) – something which will be explored further in later chapters. Weltevreden (2007) claims, however, it is not as straightforward as simply urban against rural. For example, e-commerce and city centre retailing might be complementary at first as shoppers look at products on line before buying in town whilst the city centre can constitute a source of information before an on-line purchase is made. Moreover, the issue is complicated by the fact that many users are actually accessing services from the workplace, and increasingly mobile devices, which could ultimately neutralise provision to a considerable extent.

Others have also attempted to incorporate the range of socioeconomic and geographic variables discussed and segment consumers and their level of grocery expenditure based on a range of classifications. The traditional method has been to use the Jictnar classification, commonly used in marketing which labels households/persons A-E (with A representing affluent professional workers and E unskilled manual workers). The conclusion was that those in the higher groups (A and B) spend more on food than those in the bottom groups (Poole *et al.*, 2002). With regard to store patronage, Wrigley and Clarke (unpublished data) demonstrate that the main customers for discount retailers were those in the more deprived D and E socioeconomic categories. Druckman *et al.* (2008) and Thompson *et al.* (2012) build on the use of this somewhat crude classification by using the geodemographic Output Area Classification (OAC) developed by Vickers and Rees (2007). In particular, Thompson *et al.* (2012) provide detailed insights into the customer patronage of a range of retailers operating in the British food market. It is shown that high end retailers such as Waitrose and Marks and Spencer have far more affluent customer bases than the discounters and frozen food retailers.

3.4.5 Consumer Attitudes and Cultural Drivers of Expenditure

In addition to the socioeconomic and demographic drivers of consumption, grocery expenditure is also associated with the cultural needs, abilities and opportunities that shape an individual's choices. Rozin *et al.* (1986) argue that the economic factors such as price, income and product availability influence only the actual consumption of food and not an individual's likes or preferences. This is particularly relevant in times of economic prosperity or recovery when budget constraints are relaxed, as personal preferences become more important for purchasing decisions.

At the most basic level, consumers need to satisfy their needs for food and shelter, but they also need to feel free, relaxed, secure, have and defend, belong (social status) and be different (Jackson, 2005). Consumers are often locked into particular consumption patterns due to a complex mixture of institutional, social and psychological factors (Jackson, 2005). Society and social values have changed remarkably in recent decades. One of the main forces has been individualisation, stimulating self-expression, the importance of believing in the individual, and the desire for ownership and personal freedom (EEA, 2005). This has had a huge impact on the way we consume; by consuming we can express ourselves through the goods and services that we choose and we can enjoy the feeling of personal freedom (travel, having a car, etc.). Alternatively, other commentators argue that consumption is more about status – driven as much by the desire to belong or identity to certain groups that consumers define themselves in (Moisander, 1998: cited in EEA, 2005). This need to belong to certain groups is further enforced by the impact of the media and entertainment led services (Parsons, 2003). The media and often contributes to changing consumer behaviour by creating a sense that buying a certain food product will make us happier, improve our status in society, the way we look, or enable us to avoid risks we had not previously imagined (Jackson, 2005).

In conjunction, the food habits and dietary patterns of consumers in Western society are changing, as consumers are far more informed about what they eat than in the past (Lazaridis and Drichoutis, 2005). For example, due to health concerns, consumption of low fat food and vegetarianism is increasing due to cholesterol concerns in the EU and US (Lazaridis and Drichoutis, 2005). This is why nutritional content and nutritional labels of foods have emerged as an important aspect of the food purchasing decision that can help consumers make informed and healthy purchases. Studies have found that food labelling can significantly affect consumer behaviour helped more recently by technology, as mobile phones with cameras transformed into barcode readers can give consumers better nutritional information on comparable products (Lazaridis and Drichoutis, 2005). However, nutritional content is not the only health property

of foods that consumers want to be informed of, they are also concerned about food safety - a factor that can have a major impact on reshaping consumer preferences and tastes (Lazaridis and Drichoutis, 2005; Leischnig *et al.*, 2011). For instance, certain consumers are willing to pay more for organic products that they perceive to provide greater animal welfare (Leischnig *et al.*, 2011).

3.3 Understanding Supply-side Changes in the British Grocery Market

As those factors influencing demand have already been discussed in some length, what follows is a historical review of the literature surrounding the supply-side structural changes in British grocery retailing. There is already an extensive and wide-ranging literature on this topic (Wrigley, 1987; Hogarth-Scott *et al.*, 1994; Wrigley, 1994; Langston *et al.*, 1998; Hughes *et al.*, 2009) - however, before the most recent 'recessional' changes in the British grocery market can be analysed, it remains crucial that the responses of the grocery retailers to structural changes in the grocery market are understood.

3.3.1 Retail Change, 1960s to 1990s: The 'Golden Age' of Retailing

British retailing over the last 30 years has changed fundamentally in its role in the British economy, "...it has moved from being an agent used in the passive display and sales for manufacturing output, to take on an active role in determining what is consumed and what is manufactured in the economy" (Dawson, 2004:1). Understanding how this transition came about is crucial when considering grocery retailing in the twenty-first century. This section aims to cover the first phase in grocery retailing since the Second World War, the 1960s to the early 1990s, a period covering both the foundations and eventual characteristics of what would become the 'golden age' of retailing, a term coined by Wrigley (1987) to describe the dominance of food retailers in terms of their market power and concentration.

Retail Change in the 1960s and 1970s

The first era begins with the 1960s and represents an important period in the development of the modern British food-retail market, as it followed the self-service revolution of the post-war age (Poole, 2002; Lloyd and Ogbonna, 2001). In the late 1950s and early 1960s, market conditions meant that manufacturing firms had substantial control over the supply chain. More specifically, the Resale Price Maintenance (RPM) legislation gave manufacturers the power to control the prices that retailers could charge for their products. This created an artificial market wherein retail companies were powerless to compete on price. Additionally, RPM created an environment which strongly benefited small independents, as retailing was organised on the

basis of hierarchical centres and local spatial monopolies (Poole, 2002). This is evidenced by the fact that the thousands of independent grocers and consumer cooperatives in Britain during the 1950s had a combined market share of 78 per cent (Wrigley, 1987).

However, much was to change in the grocery market in the mid-1960s. In 1964, the RPM was abolished (Wrigley, 1987; Lloyd and Ogbonna, 2001), a policy change which was to become a defining moment in the retail sector. Removal of this regulatory mechanism shifted the market power towards the retailers by giving them the freedom to set their own prices for the goods they sold, a right previously held by the manufacturers. Pommering (1979: cited in Lloyd, H. and Ogbonna, 2001) recognised this as a shift from 'manufacturers as kings' to 'consumers and trade as kings'. More specifically, by the late 1960s and early 1970s, market dominance had shifted in favour of the retailers, in particular to the larger more powerful organisations that were able to increase their vertical power over the manufacturers (Clarke, 2000). This increased leverage meant food retailers were able to offer discriminatory discounts in order to influence the prices at which goods were supplied. This led to retailers having increasing control over supply networks which reduced the warehouse space of stores, and thus the transfer of inventory holding costs from the retailers to manufacturers and suppliers (Wrigley, 1989). Furthermore, investment in computerised stock and financial control systems through Electronic Point of Sale (EPOS) and Electronic Financial Transfer at Point of Sale (EFTPS) facilitated greater control over product distribution, giving further gains to labour productivity (Wrigley, 1987; 1989).

Due to the removal of RPM, price became the most important competitive attribute in the industry as retailers aimed to 'pile it high sell it cheap' (Palmer and Beddall, 1997: cited in Poole, 2002). However, despite the fact that major multiples were able to increase their market share during this era, many suffered the inevitable consequence of direct price competition as consumers became to enjoy the benefits of low prices (Lloyd and Ogbonna, 2001). Price alone soon became insufficient to secure competitive advantage and instead just another factor driving consumer spending. Moreover, "*...as the general standards of living increased, customers became more discerning, demanding greater levels of quality, service and convenience*" (Lloyd and Ogbonna, 2001: 164). Consequently, food retailers sought to manage their organisational culture and separate themselves from their rivals through the levels of customer service they provided. For instance, firms would use their company image in an attempt to shake off their 'cheap and nasty' reputations (Ogbonna and Wilkinson, 1988; cited Lloyd and Ogbonna, 2001). Nonetheless, increasing standards of living benefited the retailers in other ways. For instance, during the post-war recovery, consumers were becoming more affluent, more mobile through car ownership and increasing numbers owned a fridge-freezer (Guy, 1997). Coupled together, these factors meant that customers could complete a weekly shop in one trip, without having to

rely on local shops for fresh produce. In addition, Fernie (1997) argues that increased consumer affluence and mobility also began to influence product demand in terms of range and variety, as more people travelled abroad and wanted to experiment with international products. In response to these lifestyle changes, the large food retailers were able to increase their horizontal power over the smaller independent retailers by pushing forward with the development of large store formats that allowed for increased savings through economies of scale and diversification into more rapidly growing and more profitable non-food sectors (Lloyd and Ogbonna, 2001; Wrigley, 1987). These larger stores were also built in previously ignored out-of-town locations, a strategy imposed to take advantage of increasing suburbanisation trends (Burt and Sparks, 2003; Wrigley, 1994).

This decentralisation of retail provision began to displace traditional high street retail operations and impacted heavily on the smaller independent retailers. This is evidenced by the increased levels of market concentration at the time by larger, more powerful chains, consolidated by substantial levels of organic growth and increasing acquisitions of the smaller independent players (Wrigley, 1987; Lloyd and Ogbonna, 2001; Dawson, 2004). What began in the late 1970s was an ever increasing domination of the grocery sector retail provision by a progressively smaller number of national and international multiple retailers. By the start of the 1980s, five dominant retailers had emerged in the grocery market, possessing a combined market share of 43 per cent by 1983 (Wrigley, 1987). The 'big five' consisted of Sainsbury, Tesco, Dee Corporation, Argyll Group and Asda (Associated Dairies Group), several of which either did not exist or were just small organisations in the 1960s. In comparison, the collective market share held by the independents and consumer cooperatives had fallen to 30 per cent, a far cry from 78 per cent held in 1950 (Wrigley, 1987).

The 'Golden Era' of Retailing: From 'Price Wars' to 'Store Wars'

The deteriorating market power of the manufacturers was accelerated during the 1979-82 recession, as the downturn decimated the manufacturing base of the economy (Dawson, 2004). Moreover, the subsequent consumer-led recovery and economic prosperity which followed in the middle part of the decade hugely benefited the retailers. Wrigley and Lowe (2002: 24) state that, "...a strong sense of an increasingly service-sector based economy shaped by retail capital and an overwhelming retail revolution began to emerge". The continued polarisation of the retailing and manufacturing sectors through the maturing power of retailers was fuelled in the most part by a favourable *laissez faire* regulatory environment (Wrigley, 1994; Langston *et al.*, 1998; Hughes *et al.*, 2009). For example, the relaxed approach to market regulation led to growth in own-label trading, often squeezing out well-known manufacturer brands. Moir (1990) debated the possibility of the existence of monopoly of power, noting that large stores can

dominate local markets, limiting competition and colluding with other stores to change product prices and margins in order to reap higher profits. As a result, throughout the 1980s, a number of the leading retailers were subjected to continuing allegations of collusion and price-fixing in order to increase their own brand sales (Wrigley, 1993; Lloyd and Ogbonna, 2001).

This period of 'price wars' (Wrigley, 1991) ultimately led to the Monopolies and Mergers Commission (MMC) report entitled 'Discounts to Retailers' in 1981 and the Office of Fair Trading (OFT) investigation in 1985. Both investigations were designed to examine the impact of increasing retailer concentration on the nature of competition in the British retailing industry, after major concerns were raised over British grocery retailers exploiting their market power to the detriment of suppliers and consumers (Lloyd and Ogbonna, 2001; Burt *and Sparks*, 2003). Despite the allegations, in neither report was there any conclusive evidence to support the price-fixing claims. Nevertheless, the concerns did not subside, as levels of competition were again a priority to the British authorities in the late 1990s, when a Competition Commission (CC) investigation into the leading firms was launched. Once more, the Commission found little evidence of abuse of market power in terms of pricing and profits; however, it did express concerns over the treatment of suppliers (CC, 2000, cited in Burt and Sparks, 2003).

Throughout the late 1980s and early 1990s, the out-of-town movement of the leading grocery retailers evolved into an intense competitive struggle for sites in what Howard (1995) defined as a 'race for space'. Propelled by the economic boom of the 1980s, the major food retailers became "...locked into strategies of accumulation in which capital investment in new store expansion programmes became the all-consuming engine of corporate growth" (Wrigley, 1998: 15). The era of 'price wars' gave way to an era of 'store wars' (Wrigley, 1991). During the 1960s and 1970s, retail branch location had not been considered as a major strategic issue. However, during the 'store wars', location became an integral part of competitive strategy and was widely viewed as an important way for firms to achieve strategic advantage. Moir (1990) claims that retailers wanted to acquire sites which offered "...high catchment area expenditure but limited competition from stores of similar size and vintage" (Moir, 1990: 108). By 1987, at least one store was opening every week as large retailers rationalised their store portfolio operations to a more tightly controlled store formula (Wrigley, 1998). This meant that the major retailers closed down smaller stores at the expense of larger, more profitable supermarkets. Superstore development was positively supported by government legislation through the creation of Enterprise Zones, an extension of trading hours and Sunday trading (Davies, 1986). For instance, in 1972, Tesco had 790 grocery stores in the UK with 518 stores of less than 5,000 square feet, but by 1981, only 131 of these smaller stores were left and by the mid-1990s, Tesco had 566 stores of which 264 were superstores of over 25,000 square feet (Dawson, 2004).

The pace of rapid development organic development was also synonymous with a series of mergers and acquisitions, as the key players sought to strengthen their positions. With regard to the main retailers, Asda for example, achieved expansion as early as 1966 through the acquisition of Gem Super Centres (Jones, 1981), and then later via a merger with MFI in 1985. In addition, between 1960 and the 1980s, the Dee Corporation acquired several companies such as Gateway, International stores and Fine-Fare Ltd (Duke, 1989). One of the more high profile takeovers was Argyll PLC's £681 million purchase of Safeway Food Stores Ltd (Wrigley, 1987), a deal which transformed the company both in scale, power and market concentration. This was closely followed by Tesco's takeover of Hillards Ltd, a little known Yorkshire-based supermarket chain which commanded 1 per cent of grocery sales (Wrigley, 1987). In what was a hard fought battle, the deal ended up costing Britain's second largest food retailer (at the time) £223 million. Nonetheless, whilst mergers and acquisitions offered many benefits through economies of scale and reduced overheads, Duke (1989) also illustrates the dangers of acquisition as a strategic weapon through a number of the failed and problematic deals. For example, the Dee Corporation encountered difficulties integrating its portfolio of assorted assets into an efficient chain with a single identity. The Dee Corporation then became a target itself for acquisition, when it was bought by the Isosceles Consortium. Isosceles then sold a substantial number of their new stores to Asda after over-extending itself. Additionally, Asda also faced problems after merging with MFI; the companies demerged two years later at a loss due to financial pressures associated with the 1990 -93 recession (see Chapter 2).

The intensely competitive periods of 'price wars' and 'store wars' became known in the academic literature as the 'golden age' of retailing (Wrigley, 1991; Burt and Sparks, 1994; Clarke, 2000; Wrigley, 1998;). At its peak in 1991, the *annus mirabilis* of UK food retailing (Wrigley, 1994), profits and margins of the 'big three' reached record levels as they were investing 22.3 billion per annum in new store expansion programmes and computer-based IT systems. Over the course of this 'golden age', the retail market became heavily concentrated, as retailers aimed to penetrate new markets as a way to reinforce their national brand. Furthermore, as two of the top five firms (Gateway and Asda) began to suffer from severe financial difficulties related to debt burdens assumed during the leveraged buyout of Gateway in 1989, the top three (Sainsbury, Tesco and Argyll) began to separate out in terms of growth, profitability and capital investment levels from large store openings (Wrigley, 1994). Through the rapid expansion schemes and mergers previously described, the major corporations began to move out of their traditional heartlands into other regions to consolidate market share. For example, Sainsbury's expanded northwards and westwards from its original core in the South East, and Asda expanded southwards from the northern metropolitan areas (Wrigley, 1987).

However, whilst there was still a clear regional dominance by some retailers in 1991 shown by Burt and Sparks (2003), in the 1970s and 1980s this would have been far more defined.

As the main retailers continued to expand outwards from their traditional heartlands in pursuit of a bigger share of the national market, they became embroiled in a frantic trend to widen their store networks across the country. This led to the competition for key sites becoming increasingly intense by the early 1990s and the pressure to find suitable sites increased significantly. At the time, Duke (1989) stated, “...the major multiples are currently engaged in a scramble for those that remain, paying high prices for sites that, just a few years ago, they might have rejected as being too marginal for exploitation” (Duke, 1989: 19). This comment reflects how the anticipation of saturation in the industry began to drive the fierce rivalry between multiples (Langston *et al.*, 1997). In the early part of the decade (1990), a number of specialists warned that the growth era of food retailing industry was ending with most forecasts predicting a mature phase of consolidation (Davies *et al.*, 1985). By the late 1990s, the food sector became one of the most strongly concentrated markets in the British economy with five firms controlling over 50 per cent of the market in; Sainsbury’s (16.4 per cent), Tesco (11.9 per cent), Argyll Group (9.7 per cent), Asda (8.2 per cent) and Dee Corporation (7.3) (Langston *et al.*, 1998; Burt and Sparks, 2003; Dawson, 2004).

3.3.2 Grocery Retailing in the 1990s: The End of the ‘Golden Age’

As discussed, the ‘golden age’ of retailing represented a period in the grocery market whereby the major retailers strengthened their market power through consistent profit increases from expanding store networks. The industry became highly concentrated, with the majority of market share being divided amongst a small selection of dominant retailers (the ‘big four’). However, from this unprecedented growth developed a certain feeling of fragility for the food retailers and by the 1990s the market leaders in the grocery industry were beginning to realise that the “...halcyon days of the industry in terms of increasing profitably were over” (Archie Norman the chief executive of Asda at the time, cited in Wrigley, 1994: 5). Unease was growing about the ability of the major multiples to sustain such growth, as several market factors combined to produce a “...significant shift in competitive conditions” (Wrigley 1996: 116). These factors can be summarised as: worries about the marked disparity between the UK property market and the food retail property market (‘property crisis’); the change in the Government’s attitude towards retail planning away from the *laissez-faire* stance of the 1980s; growing public concern over the dominance of the food retailers and doubts regarding the potential limits and sustainability of superstore development programmes (market saturation);

and pressure on incumbent grocery retailers resulting from the market entry of European limited-line discounters.

The UK Retail 'Property Crisis'

By the early 1990s, as the competition for retail space increased, the 'store wars' were becoming increasingly considered as "...*self-enforcing and dangerously narrow paths of capital accumulation*" (Wrigley, 1994: 19). Growth throughout much of the 1980s and 1990s had been so rapid that many retailers had paid, and become used to paying, property costs well above those seen in other sectors of the British economy (Langley *et al.*, 1998). Consequently, concerns soon began to surface from academics and city analysts over the viability of sustaining the previous levels of uninterrupted growth during the 'golden age', as the overvalued property portfolios left the retailer's vulnerable (Wrigley, 1991; Shiret 1992a; 1992b). In addition to the anxieties about retail property overvaluation, there was apprehension over the extremely high sunk costs possessed by the major grocery multiples, and the dangerous burden these might represent in the event of a retail property crisis. Sunk costs are defined by Mata (1991) as "...*those costs of a firm which are irrevocably committed to a particular use, and therefore are not recoverable in case of exit*" (Mata, 1991, cited in Wrigley, 1996: 117).

These concerns became reality when the UK economy went into recession during 1990-93. In what was a deep service and property-led recession, domestic and commercial property values fell precipitously in both real and absolute terms (Wrigley, 1994). Having invested heavily in new-store investment programmes that had defined their competitive strategy during that period, the decline in property values meant a large proportion of the land that new stores were built on was now worth much less than when it was originally purchased. For example, a great deal of Tesco's expansion during the late 1980s took place in southern England, a part of the country suffering some of the greatest falls in property values which contributed to Tesco recording a fall in profits of 22 per cent between 1993 and 1994 from its 1992 to 1993 levels. In order to avoid a massive collapse in market confidence, Shiret (1992b) argued that a policy of asset depreciation was needed by the major retailers. Despite the warnings, the food retailers made a determined attempt to ignore the arguments. Furthermore some commentators such as Guy (1997) disputed the importance of sunk costs as financial burdens, arguing instead that that in general, "...*'most retailers' property holdings can rightfully be regarded as assets rather than as sunk costs...The grocery industry, although of great interest and significance in its own right, is not typical of retailing*" (Guy, 1997: 1462).

Wrigley (1994) states that it was only Morrisons that moved quickly to adopt Shiret's (1992a; 1992b) suggestions, as the company began a programme of asset depreciation at a rate of 1 per

cent in late 1992. Eventually, almost two years after concerns were initially made, the other retailers including the 'big three' were forced to accept the validity of changing market conditions and followed suit. Argyll was the first of the 'big three' to react in December 1993, announcing that it was to start depreciating its store values and slowing its expansion programme. Tesco soon followed in 1994, accepting that it had paid "...a 'premium' for much of the land on which its superstores were built that was well in excess of any conceivable 'alternative use value' that might be realized on exit from those sites" (Wrigley, 1996: 123). Tesco stated it was to begin depreciating its buildings in a similar fashion to Argyll but at a cost of £36 million per annum and with a one-off write down of £85 million to cover surplus land (Poole, 2001). Finally, in 1994, Sainsbury also conceded, after resisting the call for asset depreciation the longest. Sainsbury began depreciating its buildings, thus incurring an annual depreciation charge of £40 million and through a major write down of £365 million, wiping £850 million off the market valuation of the company in a single day (Wrigley, 1996). Less than two years after the concerns about property valuations had first been raised, all had been forced by the nature of changing competitive conditions to accept the validity of the arguments.

Planning Policy Guidance

As discussed in, the *laissez-faire* attitude to planning policy guidance in the 1980s allowed for the rapid growth of out-of-town retail developments. By the 1990s, however, it soon became apparent that the out-of-town retail parks and regional centres were having a detrimental impact on town centres and retail high streets through an observed decline in the number of small, independent grocery stores, coupled with a loss of local jobs and the emergence of local 'food deserts' (Ferne, 1996; Raistrick, 1998; Langston *et al.*, 1998; Bromley and Tallon, 2004). Consequently, the Department of the Environment (DOE) issued the original Planning Policy Guidance (PPG) 6 in 1988. It stated that "...*planning permission decisions should not be concerned with commercial competition, and that only in exceptional cases was it necessary to take account of the impact of large-scale retail developments on existing centres*" (Howard, 1995: 234). Reactions to this initial PPG6 were somewhat varied, as some believed it actively encouraged out-of-town development as a means to relieve pressure on town centres, whilst others argued the legislation actively limited such growth. Consequently, this caused a great deal of confusion between local authorities and retailers, which meant the first PPG6, did little to halt the growth of the major multiples in out-of-town locations.

On account of this confusion, in 1993, a revised PPG6 was released by the DOE reaffirming the Government's belief in town centres as the anchor of the British retailing system (Wrigley, 1994). This mandate was inherently more interventionist with regards to its stance on out-of-

town retail applications. The two most evident objectives from the mandate were to sustain or enhance the vitality and viability of town centres, and to ensure the availability of a wide range of shopping opportunities (Ferne, 1996). The Government felt the revised directive would ensure protection for town centres, and that the community would benefit from effective competition between retailers. Soon after, PPG6 was complemented by PPG13 in 1994. Howard (1995) states that PPG13 was designed to reduce car use and influence travel patterns, via land-use planning, in a long-term commitment to environmental improvement. This stance on planning was reiterated in yet a further revision of PPG6 in 1996, which stated town centres are preferable to edge-of-centres sites, which are preferable to out-of-town sites (Guy, 1997). The 'sequential test' was applied in determining planning applications.

Wrigley (1998; 15) reflects on the impact of PPG6 and PPG13, arguing that they "*...have actively discouraged green-field out-of-town developments, thus derailing the out-of-town 'gravy train'*". This statement is reinforced by the fact that planning application success rates for superstore developments decreased from over 50 per cent during the 1980s to fewer than 30 per cent in some years after 1993 (Guy, 1997). Others, however, question the impact of such policies in bringing the 'store wars' to an end (e.g. Field, 1997). The general feeling amongst those criticising the effect of PPG6 and PPG13 was that they were too general and the real impact on retailing was held in the hands of the local authorities. In actual fact, with the benefit of hindsight, the long-term effects of PPG6 have been to force retailers to work within the new regulatory constraints by exposing and exploiting flaws in the legislation in the process (Hughes *et al.*, 2009).

The Saturation Debate

On account of the retail change discussed so far (capital concentration, rapid store network expansion, the property crisis and changes to planning legislation), unsurprisingly, the next issue up for discussion is the concept of market saturation. The definition of retail saturation generally "*...implies there is a notion that some maximum possible number of profitable stores exist in a customer market*" (Guy, 1994: 3). Langston *et al.* (1997: 79) expand on this rather crude notion and define saturation as occurring "*...in situations where further retail expansion would prove unviable, as a result of overcapacity on the supply side effectively spreading available consumer demand too thinly*". One of the first authors to raise the issue of market saturation with regards to the grocery market was Wrigley (1987: 1286): "*With competition for key sites becoming increasingly intense, and saturation levels for grocery superstores rapidly being approached in several parts of the country, it is a moot point whether the annual levels of*

turnover and profit increases achieved by the major grocery corporations can continue to be sustained on the basis of new-store expansion programmes”.

Although Wrigley (1987) was one of the first to raise the issue of saturation, Duke (1989) was the first to take a real standpoint on the matter. Duke (1989) believed that in terms of the number of physical stores, it seemed possible that a limit would be reached by 1990. Nevertheless, in light of both the preceding and following discussions, Duke’s prediction of market saturation was somewhat premature. Especially considering that he believed maximum levels of outlet density had already been reached in parts of the north east of England. Duke’s assertions were based on two factors. First of all, the UK population was relatively stable and growth was estimated to be only about one million in the 1990s. Secondly, per capita food consumption volume cannot, by definition, exceed our physical capacity to consume, and is therefore likely to decline rather than grow (Duke, 1991).

Today, it is easy to criticise these early predictions of market saturation. However, at the time, there was definite evidence that the pace of grocery store development was slowing due to the burden of sunken costs from the ‘property crisis’ and the Government’s restrictive stance on planning. New stores were also serving smaller catchment populations than those developed in previous years, and were arguably less profitable (Guy, 1997). Furthermore, even a large proportion of retailers, manufacturers and retail analysts believed that the saturation ceiling would be reached by 2000. As investment in new stores began to decline, the retailers shifted to spending more on refurbishment and extensions of existing stores. Sainsbury’s, for example, attempted to expand their sales area by 5 per cent annually around this time, but much the growth was in the form of enlargements of existing stores (Guy, 1997). Asda also carried out a substantive store modernisation programme as a way to develop their non-food lines. As the retailers continued to grow and adapt, opinions on market saturation changed. Guy (1997) argued that saturation was unlikely to descend across the country like a blanket of uniform thickness and was more of a local and regional phenomenon. Furthermore, it has been suggested that the ‘property crisis’ of the early 1990s was, ironically, a fortunate shock to the major food retailers in slowing the pace of new store openings (Langston *et al.*, 1998).

The European Deep Discounters

Another key problem the major retailers had to face at the end of the ‘golden age’ was the arrival of the limited-line discount food retailers from Germany and Scandinavia in the early 1990s. Due to the large levels of property investment that had been committed to industry by the major players, there was an opportunity in the market for low expenditure, low margin, low capital intensity, limited line discounters (Wrigley, 1994). The entry of the discounters into Britain also

added a further element to the saturation debate, indicating that in some respect, saturation could not be imminent.

Limited-line discounters or limited assortment discounters are characterised by stocking fewer than 1,000 lines, are typically 10-20 per cent cheaper and operate through stores of about 7,000 square feet in size (Burt and Sparks, 1995). The first to enter the market were Aldi (Germany) and Netto (Denmark), followed shortly by Lidl (German). All three retailers were able to take advantage of a particularly difficult time in the retail market and penetrate a number of significant gaps in the market. The first real gap the discounters exploited was a 'value platform' gap, which arose from the main retailers focus on superstore development, characterised by extended product choice and relatively high prices (Burt and Sparks, 1995). The second was a 'location gap', as the discounters refused to conform to the out-of-town developments and instead targeted the abandoned urban high streets. Other reasons which provided the discounters with the opportunity for market entry are highlighted in the literature as; high profit margins in the UK grocery business, potential superstore saturation in most areas, high price strategies of leading multiples and the general economic recession (Hogarth-Scott and Rice, 1994).

Initially, the major retailers were in denial about the threat of the discounters as serious competitive rivals; nevertheless the big players were eventually forced into action as the discounters' stores grew in number. The chairman of Sainsbury's stated "*...anyone who said there was not an issue about discounters would not be living in the real world*" (Wrigley 1998; 15). As the discounters started to form a real threat to the domestic retailers, controversy surfaced over allegations that the current retailers used barriers of entry to prevent the discounters from gaining a significant foothold in the market (Hogarth-Scott and Rice, 1994; Guy, 1997). Increasingly, therefore, the market entry of the discounters began to amplify the level of public unease concerning the oligopolistic dominance of the domestic retailers. Thus, "*...the emergence of the discount sector as an important influence on the nature of competition in UK food retailing, prompting the possible erosion of margin structures, served merely to fuel public unease and expose more starkly the privileged relations of the major food retailers with the regulatory authorities*" (Wrigley, 1994: 16).

Despite the initial difficulties, the economic conditions of the 1990-91 recession helped play a major role in the markets opening up to the new European discounters by creating a number of favourable opportunities for trading (as stated in Chapter 2). During this time, there was a clear level of polarization between consumers with increased disposable income and those such as the unemployed and single parent households (Burt and Sparks, 1994; Hogarth-Scott and Rice,

1994). Whilst companies such as Marks and Spencer targeted the more affluent consumers, the deep discounters were able to target those customers with much lower levels of income at the bottom end of the market. Locating first in areas of major urban deprivation and 'value sensitive' regions, the deep discounters soon gained considerable market share in the North of England. For example, Netto began operations in Leeds, Sheffield and Liverpool, while Aldi focused on building stores in the North West and West Midlands (Wrigley, 1998).

Once established, the discounters began to have profound effect on the other retailers. The problem was that the discounters traded on much smaller profit margins (15 per cent) than those of the superstores (38 per cent) (Wrigley, 1998), but the discounters were still able to record the same return on capital as the major multiples by functioning with a much smaller capital base format and through a highly stringent cost control mechanism. As the UK's original discounter, Kwiksave's key business strengths soon became eroded by the new competition. Kwiksave rapidly became less viable and was forced onto difficult middle ground between the new deep discounters and the major players in the market (Hogarth-Scott and Rice, 1994; Wrigley and Clarke, 1998: cited in Poole, 2002). Even with Kwiksave expanding its operations with the buyout of Shoprite, its sales were still not acceptable. In 1997, Kwiksave announced pre-tax profits of £74 million, barely half of the 1993/94 total (Poole, 2002). In 1998, there was a merger between Somerfield and Kwiksave with plans for 500 of the Kwiksave portfolio to be changed to the non-discount Somerfield fascia. In addition, the major multiples reacted by discounting prices on main items. For, Asda, Gateway (later Somerfield) and the Co-op, the competition was so fierce in northern recession-hit towns and cities that they experimented with new fascias (Pioneer for the Co-op, Food Giant for Gateway and Dales Discount for Asda) in order to offer a deep discount format in retaliation (Wrigley, 1994). By 1996, the discounters were well and truly part of the retail fabric as the combined market shares of the foreign entrants were estimated to have increased to around 1 per cent (Poole, 2002).

3.3.3 Grocery Retailing in the Twenty- First Century: The 'Post-Property Crisis'

In the late 1990s, food retailers were still facing the threat of market saturation. Although, initial predictions had been somewhat premature and easily disputed, the saturation debate still continued as store expansion programmes slowed. In contrast, strong evidence still existed against looming market saturation. First of all, one of the major issues in understanding whether saturation has occurred depends on the way in which the concept is defined. This has been echoed by a number of commentators who argue that a more detailed analysis of local variations in grocery store provision is vital when determining the real extent of market saturation (Lord,

2000; Langston *et al.*, 1998). The concept of saturation is altogether meaningless when considered at the national level, therefore, even with the introduction the planning policies and the success of the limited-line discounters, there was still widespread regional and local variation in floorspace per head of population for the large multiples in the UK in the late 1990s (Langston *et al.*, 1998; Hughes *et al.*, 2008). Furthermore, Langston *et al.* (1997) recognised that changes in the country's socio-demographics over time had the potential to allow for further retail expansion, such as increasing single person households and future population movements (as discussed in Section 3.2.3).

In reality, saturation did not occur; instead, retailers have adapted, customising their product distribution around different location types and by using a range of diversification methods to attract further custom away from competitors. With this in mind, the remainder this chapter examines attempts by the grocery retailers to overcome or delay perceived market saturation, through various diversification strategies, the development of new store formats, internationalisation and alternative channels to reach consumers.

Reaction to Market Change

One of the first reactions to market change was the continuing response to the success of the limited-line discounters. As the discounters became established in the market, the domestic retailers had to move away from non-price competition to a more price focused environment. The long-term downward repricing on price mentioned in Section 3.3.2 was backed well into the late 1990s by the 'big three' (Wrigley and Lowe, 1996). Tesco, Safeway and Sainsbury launched 'Value', 'Savers' and 'Economy' own-label ranges respectively in an attempt to match the discounters on price. Furthermore, there was a sustained reconfiguration to 'discount superstore' fascias by a number of the second tier retailers. The largest grocery multiples however did not adopt such a strategy, because *a 'second label' discount format for older vintage superstores would involve fundamental risk to a laboriously built position in the market*" (Wrigley and Lowe, 1996: 132).

Wrigley and Lowe's (1996) comments are exemplified by Asda's return to its core format, and the discontinuation of the Dales fascia, once the company re-joined the top tier of UK retailers. Moreover, Hogarth-Scott and Rice (1994) argued that the multiples still had more to fear from each other than the discounters. It could also be argued that the response to the discounters was, in actual fact, more of a reaction to economic instability at the time. To ensure survival during the recession, it would have been necessary for retailers to reposition on price anyway (Ferne, 1997). For example, Poole (2002) believes when Asda introduced Dales, that it was actually part of a general reformulation of corporate strategy in dealing with the firm's debt crisis of the

early 1990s. Consequently, in terms of a long-term course of action, the major retailers had to develop a competitive advantage not only price, but through quality, customer service, loyalty, diverse forms of retailing and technological developments.

Some of the more diverse forms of retailing employed by retailers to ensure they stayed competitive include the introduction of non-food products in stores, and diversification into other retail sectors (Wrigley, 1991; Field, 1997). With regard to offering new non-food products in-store, this was done in an attempt to increase turnover and improve profit margins. In particular, product categories such as cosmetics, electronics, pharmaceuticals, petrol and clothing were seen to be the most profitable (Guy, 1997; Lloyd and Ogbonna, 2001; Hawkesworth, 1998). Pharmaceuticals specifically became a popular addition to stores, as retailers benefited from the abolition of RPM on over-the-counter medicines in 2001. The adoption of non-food categories by food retailers was recognised by some as a further threat to the viability of the high street (Kervenoael *et al.*, 2006), with some non-food lines occupying up to 40 per cent of the space in larger stores (Guy, 1996). In conjunction, a number of the retailers diversified into other retail sectors. This, however, was not a new occurrence, with the opening of the first Homebase store in 1981 by Sainsbury's preceding diversification as a possible response to saturation by almost 10 years. Interestingly, Sainsbury's were later forced to sell Homebase in 2001, so that the company could concentrate on its core food business. Conversely, a more successful sector for the retailers proved to be finance. More specifically, Tesco introduced 'Tesco Personal Finance', whilst Sainsbury's Bank was established in 1997 through a partnership with the Bank of Scotland (Field, 1997). Both services offered customers financial products and services such as loans, saving accounts and insurance and were linked to their loyalty schemes.

In addition, the retailers also responded to the threat of market saturation by attempting to improve their relationship with consumers. Customer service, therefore, became increasingly popular as a tool for brand differentiation. One way of doing this was through the delivery of loyalty cards to improve customer retention through offering rewards for regular shopping (Poole, 2002). The retailers also benefit from the individual-level data as it provides a detailed insight into consumer spending and shopping behaviour (Lloyd and Ogbonna, 2001). As has often been the case with market innovations, Tesco were the first to pioneer the loyalty card scheme with the launch of the Tesco club card in 1995 (Poole, 2002). Safeway's and Sainsbury's soon followed with the ABC Card and Sainsbury's Reward Card respectively. Asda still do not have a full in-store loyalty card, although it did introduce the 'Fill 'n' Save' reward scheme for its petrol forecourts in 2002 (Poole, 2002). Customer service and loyalty has

remained a key differentiator for the grocery multiples, with loyal customers being regarded as cheaper to retain than attracting new customers (Burt and Sparks, 2003).

As the British grocery market continued to evolve, so did advancements in technology, in particular information technology. Rapid developments with the internet, helped facilitate a new distribution channel for retailers in dealing with the threat of market saturation. At the time, food retailers could see a number of advantages to be gained by adopting the Internet as a distribution channel. These included lower barriers to market entry, low start-up costs, the capability to get products to market, the ability to carry broader assortments, more efficient service to niche markets, ability to reach a mass audience quickly and being able to tap into a virtual community and reach a worldwide potential as geographic barriers are more easily reduced (Poole, 2002). Equally, there was still growing concern among various commentators about the negative impact of e-commerce; on account of increased customer acquisition costs, high website development costs, high merchandise return rates and the fact it denies consumers the essential social satisfaction associated with other landscapes of consumption (Reynolds, 1997).

However, despite the alleged reservations, Internet sales started to become a more integral part of the channel management strategy. Even though the Internet was and still is a relatively small generator of sales, the retailers recognised the need to manage e-commerce alongside both traditional channels and (the branch) and any new future channels (Birkin *et al.*, 2002). Originally, the main areas of growth were in high value items such as wine, chocolate and flowers because delivery costs were still high. Consequently, Sainsbury's launched internet wine sales in 1995 through a scheme named 'Order and Collect' from its Watford store. Once more, Tesco were the first retailer to offer a robust home shopping service in 1996, Sainsbury's Asda and Safeway soon followed suite with a similar facility. More recently, Tesco rebranded its online operation as 'Tesco.com' in 2000, whilst Asda underwent major expansions to its online business in 2004 and Sainsbury's launched 'Sainsbury's Online' in 2004 also. In terms of delivering goods, Tesco and Sainsbury's opted for a service whereby selected goods are hand-picked from in-store, whereas Ocado follow the warehouse model, operating from a purpose-built picking centre, purely online without any physical shops. Today, Tesco, Asda and Sainsbury's continue to invest heavily in both grocery and non-food online services as e-commerce becomes an integral part of the company's operations. Sainsbury's online sales for example are up over 20 per cent from 2010 and weekly orders now exceed 130,000 (Sainsbury's Annual Report, 2011). Sainsbury's and Waitrose had significant problems in the 2000s with their strategies. Wrigley and Currah (2006) note the importance of having a workable 'back region' strategy of stores or distribution depots to support and handle e-commerce orders (why

e-commerce remains in their opinion a geographically grounded business). In addition, there is evidence that the quality of websites is important in determining usage – e-commerce will expand more quickly if the sites are attractive, which might include reputation, reliability, ease of navigation, ability or ease of product substitution, design and ease of interaction (Wrigley and Currah, 2006; Chiagouris and Ray, 2010).

Changing Retail Formats

In April 1999, the Government ordered a CC investigation of the UK grocery sector. The origins of the reference came from, firstly, a public perception that the price of groceries in the UK tended to be higher than in other comparable European countries and the United States (US); secondly, in an apparent disparity between farm-gate and retail prices, which was seen as evidence by some that grocery multiples were profiting from the crisis in the farming industry; and thirdly, continuing concern that large out-of-town supermarkets were contributing to the decay of the high street in many towns (CC, 2000). Whilst the Commission found little evidence of abuse of market power in terms of pricing and profits, it did express concerns over treatment of suppliers (Burt and Sparks, 2003). Moreover, after examining the relevant aspects of the planning system, it was found that entry into, and expansion within, multiple grocery retailing was more difficult for parties wanting to acquire large sites in out-of-town locations (CC, 2000). Therefore, as a consequence of the tighter planning regulations, the UK grocery retailers became highly cautious about the development of large out-of-town supermarkets (Wrigley, 1998). Instead, retailers were forced to adapt by in creating more flexible formats for expansion (Burt *et al.*, 2010; Elms *et al.*, 2010).

Field (1997) states that retailers responded to the planning curbs by refurbishing existing stores, investigating in smaller and convenience formats and returning to the high street and through creating more space or extending stores. In addition to tighter planning regulations, Fernie (1997) exemplifies the influence of demand as a catalyst for increasing diversity in store formats, drawing specific attention to increased affluence and mobility. One area in particular in which the retailers invested heavily at the time was the development of smaller, more profitable stores. Birkin *et al.* (2002) termed this growth strategy as ‘niche spatial marketing’; it was a noteworthy shift from the retailer’s traditional superstore format. Furthermore, Wrigley (1998: 29) states these developments indicated an important “...*phase of reassessment of old locations of profit extraction in urban areas which, to a marked extent, had been abandoned during the era of the ‘store wars’*”. These stores had much higher sales densities and became possible through a combination of significant technological advancements in logistics and a reduction in store development costs (Langston *et al.*, 1998). The retailers responded through an introduction of completely new fascias and a return to the high street. Again, Tesco was the first to trial new formats within its portfolio of stores. These included the 10,000 square feet Metro stores rolled

out in 1993, followed by its smaller Express stores in 1995 (1,500 square feet) (Wrigley, 1998; Elms *et al.*, 2010). Sainsbury's too rolled out a number of smaller store formats under the 'Country Town' and 'Sainsbury's Central' fascia in 1994. This was then followed by Sainsbury's 'Local' in 1999. Furthermore, a number of partnerships were made with petroleum companies. More specifically, Safeway stated the aim to operate 45 petrol forecourt shops (in conjunction with BP Amoco) by the end of 1999, while Tesco introduced 17 Express forecourt stores (in conjunction with Esso) (Birkin *et al.*, 2002). Although a successful venture for the major retailers, the diversification into the convenience sector impacted heavily on the UK's independent food and grocery retailers. Previously, the competitive advantage of independent retailers (their convenience in location and opening hours, home delivery, friendly and personal service) had been difficult to match. However with the major retailers opening cheaper 24 hour convenience stores, large numbers of independent retailers began to close. For example, the number of 'non-affiliated independents' declined from 24,000 in 1996 to 22,000 by 1998 (Poole, 2002).

Conversely, some commentators postulated that the dramatic return to the high streets by the major multiples was somewhat overstated. For example, Field (1997) argued that the return of Sainsbury's and Tesco to urban areas did not really suggest a regeneration of the high street, rather just evidence that the retailers were diversifying by format, location and price. This is evidenced by the fact that Tesco had only opened 30 Metro stores, 14 of which were existing stores by 1997 (Wrigley, 1998). Moreover, Asda still remained committed to its large supermarket format in more rural locations. Rather than introduce new, smaller stores like its competitors, Asda made better use of existing space through expansions and refurbishments. Tesco and Sainsbury's too adopted this strategy, embarking on a major programme of store extensions (Langston *et al.*, 1998). Consequently, what followed was a polarisation in retail formats, as the retailers pushed forward with hypermarkets in addition to the smaller compact fascias. Tesco established its 'Extra' stores (80,000 square feet average) in 1998, which allowed it to sell a range of food and non-food products (clothing, music, videos and durables) (Lamey, 1997). Furthermore, much like the 1980s, the main retailers also continued to expand out of their heartlands through organic growth and a series of acquisitions and mergers. However, many of the retailers still maintained some level of regional dominance in 1999 (Burt and Sparks, 2003). Only Tesco, the market leader at the time had a much more uniform level of market share. In comparison, Sainsbury were still very strong in the South East, Asda in the North West and Safeway in Scotland and the North East. Poole (2002) expands on this regional analysis by providing a more detailed breakdown of market share across local authorities in GB for 2002. Contrary to the saturation debate, the top four retailers (Tesco, Sainsbury, Asda and Safeway) all extended their market share by 2 to 3 percentage points between 1999 and 2002.

Internationalisation

Research into the patterns of retail internationalisation has suggested that companies move first into geographically or culturally close markets, then, as familiarity with international markets and the operational issues involved increases over time, they then move further afield into more culturally, often geographically, distant markets (Burt *et al.*, 2008). Lamey (1997) provides an analysis of retailer motivations for internationalisation and differentiates them into push and pull factors. Those factors pushing retailers abroad are identified in the literature as increasing market saturation (Clarke and Clarke, 1998), intense competition (Lamey, 1997) and strict planning regulations (Guy, 1997). In comparison, retailers are pulled abroad by a relaxation in planning regulations, a relaxed approach to border control and the development of cross-border logistics (Lamey, 1997). Moreover, retailers are drawn by the prospect of lower levels of market concentration and, increased labour productivity and better profit margins compared to the British domestic market (Wrigley, 1989; Burt *et al.*, 2008).

By the end of the 1990s, internationalisation was by no means a new phenomenon. Due to worries over market saturation, retailers began expanding abroad prior to the onset of the UK 'property crisis' (Wrigley, 1991). Field (1997) proclaims that growth was starting to prove elusive in the UK and therefore the top retailers had no choice but to start expanding more aggressively abroad. However, for Tesco, international expansion has always been a key facet for growth. For instance, Tesco had spent £372 million on acquisitions in mainland Europe by 1998 (Wrigley, 1998). Tesco went on to acquire stakes in food retailers in four Central European countries: Global (Hungary), Savia (Poland), and K-mart (Czech Republic and Slovakia) (Poole, 2002). Other acquisitions by Tesco also include the purchase of Associated British Food's Irish food retailing business for £640 million in 1997 (Wrigley, 1998). Furthermore, by 2002, Tesco was operating four stores in Thailand under the Lotus fascia, eight in South Korea and Taiwan, and had built its first store in Malaysia as a joint venture with Sime Derby. Furthermore, at this time, international sales represented 13 per cent of Tesco's total sales. Sainsbury's first expanded into the US in 1987, via a \$261 million acquisition of the Shaw's chain. It then continued its foreign investment strategy by purchasing a share of Giant Food Inc in the US. In 1998, however, Sainsbury sold its share of Giant Foods to Ahold, but later purchased Star Markets, making the chain the second largest grocery retailer in New England (Webb, 1999). Additionally, Marks and Spencer, paid \$108 million for Kings Super Markets in 1988, a high-end New Jersey chain with a turnover of \$258 million (Wrigley, 1989). Finally, in 1999, Asda became part of the Walmart brand acquired by the world's leading retailer for £6.7 billion (Poole, 2002), an acquisition which nullified a previous agreement that Asda had drawn up with British retailer Kingfisher.

One of the most recent large scale expansions in foreign markets documented in the literature is Tesco's new Fresh & Easy brand in America. However, as stated in Chapter 2, the brand has struggled to make a profit in four years due to the harsh economic climate in America (Lowe *et al.*, 2012). This highlights how internationalisation is by no means definite route for success, as the literature also highlights a number of 'failures'. For example, Tesco also opted for European expansion, purchasing Carrefour, a chain of supermarkets in northern France in 1992 for £176 million (Poole, 2002). However, only five years later in 1997, Carrefour was later sold to Promodes as the deal was abandoned. In addition, Marks & Spencer ventured abroad in 1972 when it formed a joint venture with a Canadian retailer and opened stores similar to its UK branches. However, the policy of standardising its British retail model proved to be a self-defeating strategy in Canada through its failure to recognize differences in clothing cultural norms between the two countries (Burt *et al.*, 2002). As such it was unpicked during the 1990s, with the last outlet closing its doors in 1999. Similarly in France, the motive for Marks & Spencer's departure, in order to restructure its operations at home, impacted upon the French employees and national retail/business norms, leading to accusations of immoral and unethical behaviour (Jackson and Sparks, 2005).

Despite the levels of commitment to internationalisation by British retailers towards the beginning of the twenty-first century, it must be stated that there was still a comparatively weak showing of British retailers when it comes to European expansion (Burt and Sparks, 1995). The reasons stated at the time were said to be because of sufficient opportunities still in Britain, doubts about the exportability of food retailing, better opportunities in the US and a perceived lack of European market opportunities (Burt and Sparks, 1995). Field (1997) supports this notion and not just for European expansion, claiming that international growth by British food retailers in the late 1990s and early 2000s was limited. Nevertheless, despite starting late, international retail expansion has undoubtedly taken off in the last fifteen years as a number of retailers have followed suite and started operations in foreign markets (Burt *et al.*, 2008) – a topic which will be explore in further detail within Chapter 5.

3.4 Conclusion

To conclude, this chapter has made attempts to outline the key trends that have, and are still, shaping the grocery industry from both a demand (consumer) and supply-side (retailer) perspective. In terms of demand, it is clear that retailers need to keep track of the determinants driving consumer behaviour – as patterns of expenditure are being moulded by a collection of demographic, socioeconomic, geographic and cultural differences. This raises the important point that those trends occurring now are as just as likely to be a result of the recession as they are the structural factors documented in this review. Additionally, in evaluating the role of the

different indicators manipulating consumer behaviour, it has highlighted a number of important factors to be explored in further detail. For example, studies might explore the moderating effects of demographic characteristics, such as age – for it is apparent that Britain’s ageing population will become a potentially a dominant segment of the consumer market of the future. However, what is clearly lacking in the literature is an over-arching assessment of the importance of these trends, and in particular the spatial variations in demand and consumer behaviour. Despite a number of papers documenting the variations in urban and rural behaviour, there is little exploring the regional and even sub-regional patterns of demand in food retailing.

The second half of the chapter illustrated the wider structural changes in the grocery market, so to identify key trends which have occurred along-side or irrespective of harsh economic conditions. The key themes have been the transitions in grocery retailing during the 1960s to 1980s (the ‘golden age’) through the ‘property crisis’ in the early 1990s, to the ‘post-property crisis’ in the late 1990s and early 2000s. The literature highlighted how retailers have had to adapt to a range of external forces (including recession) in order to sustain growth. In particular, the most challenging factors have been a threat of market saturation, competition from the discounters, planning and policy guidelines and the increasing demands from consumers. The issues presented have raised several key issues that need to be addressed in examining modern grocery retailing. For instance, where does the grocery market now sit in terms of the wider economy? What expansion strategies have the retailers undertaken over the last ten years? Where do we now stand on the saturation debate and the spatial monopolies of the major grocery multiples? What are the latest planning policies to impact on grocery market? Has ecommerce been successfully integrated into the retailer’s growth strategies and is there an underlying geography? How has the recent recession impacted on the grocery retailers – i.e. has internationalisation once more offered an outlet for growth as the economy in Britain continues to struggle?

Even in this comprehensive exploration of the grocery sector, it remains difficult to determine whether changes in retailing are demand-led or supply-led. On the one hand, lifestyle changes, consumer pressures for cheaper prices and greater consumer mobility have undoubtedly created conditions allowing grocery retailers to expand. On the other hand, their development cannot be understood without recourse to the rapid growth in retail buying power, resulting in the most innovative retailers gaining greater scale economies - which in turn has allowed discount prices to be offered to the consumer. However, what is clear is that retail change involves a complex set of processes including demand (consumers), supply (retailers) and third party factors (economic pressures, government and regulators) that must be considered collectively.

Chapter 4

Data Sources: Characteristics, Validation and Study Area

4.1 Introduction

It is crucial that one understands the qualities and limitations of any data being used before conducting any type of research (Stewart, 1984; Sorenson *et al.*, 1996). Taking this into consideration, this chapter will extend our understanding of the retail system in recession through an examination of the primary characteristics of the available data to be used in the thesis. Initially (in Section 4.2), attention will be given to the different study areas that will be explored in the research. This will be then be followed by Section 4.3 which illustrates the available geographical data to be utilised. Thereafter, supply side data relating to the British retail market and the main grocery retailers will be examined in Section 4.4, whilst Section 4.5 will then document the demand data (household expenditure) accessible from official data sources. Finally, Section 4.6 will concentrate on reviewing and validating Acxiom's Research Opinion Poll (ROP) data so that confidence can be given to the findings in succeeding analysis chapters. This section will form a major part of the chapter, for it is essential that commercial data such as these are found to be fit for purpose if they are going to be used in academic research. Finally, the chapter will be completed with a summary of the main conclusions.

4.2 Selected Study Areas

Whilst some references have been made and will be made to the United Kingdom (UK), Great Britain (GB) forms the principal case study area for the majority of the research conducted at the aggregate level. Much of this analysis is contained within Chapter 5 and looks at the changes occurring within the grocery market at a national level. In this case, aggregate data refer to high-level household data composed from an aggregation of individual data for geographic areas across GB. GB contains a total of eleven Government Office regions (GOR) (Figure 4.1) and was chosen in preference to the UK because the Acxiom Ltd data sets (discussed in Section 4.5) that are used heavily in the research, are only collected within GB and

exclude Northern Ireland. Moreover, 2001 Census data are only available for Parliamentary Constituencies in Northern Ireland, geographical areas of comparable size to districts but with incompatible boundaries which leads to various harmonisation problems.



Figure 4.1. Government Office Regions in Great Britain

In addition to the national level analysis presented in Chapter 5, Yorkshire and the Humber and London have been selected as two case study regions for which results are reported in Chapters 6, 7 and 8. The reasoning behind this is primarily a data magnitude issue, as the extensive volume of Acxiom Ltd micro data means that data processing and any kind of individual level analysis is unmanageable at a national scale (in the bounds of this thesis). Therefore, Yorkshire and the Humber and London provide two manageable (from a data perspective) but distinctly different case study regions to compare against one another. Additionally, these two regions were also found to provide useful case study regions for research into the recession and the grocery market by Thompson *et al.* (2010a, 2012).

Yorkshire and the Humber is the largest Government Office Region (GOR) in GB from a geographical perspective, containing a total of 21 Local Authority Districts (LADs) and Unitary Authorities (UAs) that vary substantially demographically, socioeconomically and culturally. The population recorded from the 2011 Census is estimated to be around 5,283,700 (UK Census, 2012). Figure 4.2 demonstrates the distribution of this population across the region by

highlighting the population density in each LAD/UA, with quintile one depicting the more rural (low population density) and quintile five the most urban (high population density). Figure 4.2 highlights the highly populated cities of Leeds, Sheffield and Hull as well as the more rural areas of North Yorkshire. The combination of these two extremes within the same region makes for interesting geographical variation in behaviour. Furthermore, the varying levels of deprivation across the area identified by Thompson *et al.* (2012) will also allow for research into the effects of recession at both ends of the deprivation scale.

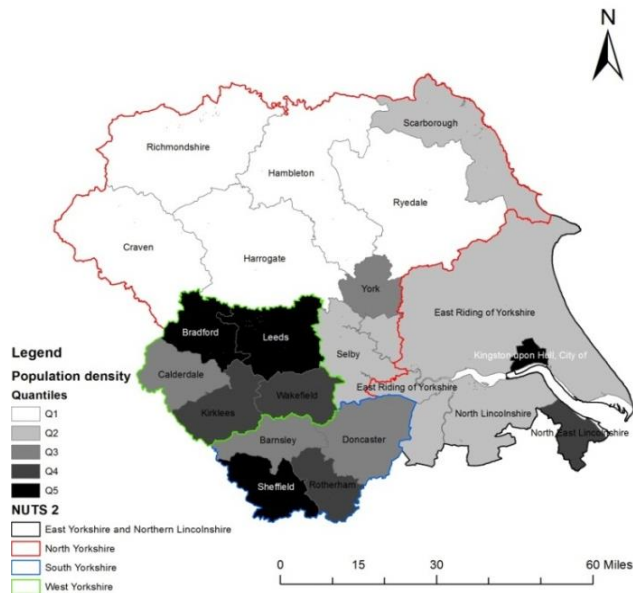


Figure 4.2. Population density in Yorkshire and the Humber by LAD

Source: UK Census (2011)

London

In comparison, London, the capital of England, is the most populated GOR in GB with recent estimates from the 2011 Census showing that the current population stands around 8,173,900 (UK Census, 2011). London is a highly ethnically diverse area, evidenced by the fact that in 2001, London was home to over two thirds of Britain’s Black population, nearly 42 per cent of the Indian population and one third of both the Pakistani and Other South Asian and Chinese populations (Stillwell, 2010). Figure 4.3 displays the population density for the City of London and each of the 32 London boroughs within Inner and Outer London. Unsurprisingly, most of the population is contained to Inner London, as it diffuses out to the less populated parts of Outer London. In addition, Chapter 2 identified London as a major point of discussion with regards to the recession. The initial assumption was that the recession would be most severe in London and the South East (Drury, 2008; Lee, 2011). However, others have shown London and the South East performing relatively better (Champion and Townsend, 2011). If this is indeed the case, it will be useful to contrast the patterns occurring within the region against Yorkshire

and the Humber – where the recession has had a great impact. London also has an extremely different retail composition compared with any of the other regions in GB and many grocery retailers have identified London as a key area for growth over the next ten years (Thompson *et al.*, 2012).

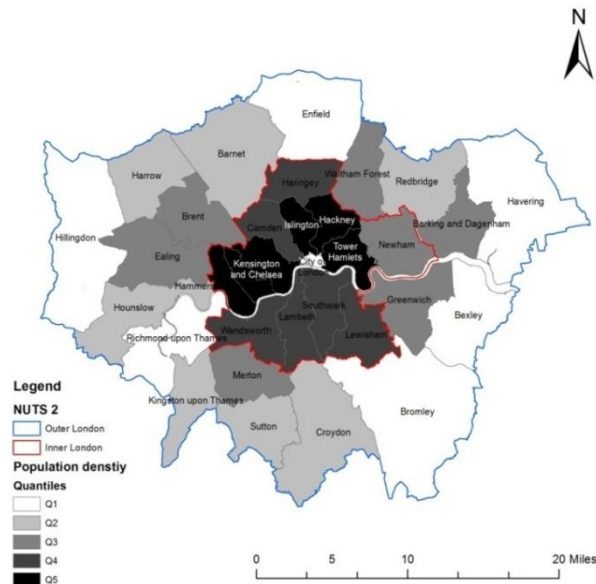


Figure 4.3. Population density in London by borough

Source: UK Census (2011)

4.3 Geographical Data and Area Classifications

The following section concentrates on the boundary datasets and various area classifications to be used in the research. The geography of GB is built on hierarchies of geographies based on a variety of systems. For example, the UK is comprised of administrative, census, electoral, environmental, postal and historical boundaries. The complex hierarchies and linkages between these composite geographies are explained in greater detail by Dennett (2010), demonstrating how the small area geographies eventually aggregate up to the national level. In doing so, Dennett (2010) also highlights the problem that not all lower level geographies are compatible, for example, electoral wards aggregate into both districts and parliamentary constituencies, but these two geographies cannot be harmonised. As such, all the geographic boundaries used in this research will be based on a system whereby they can all be aggregated into one another (Section 4.3.1).

In conjunction, area classifications involve the classification of areas into different groups on the basis of the similarity of characteristics of selected attribute features. They provide a unique way of bringing together spatial patterns from a range of variables, and identifying similarities

and dissimilarities between areas (Webber and Craig, 1978; Everitt *et al.*, 2001; Sleight, 2004; Vickers and Rees, 2007). Furthermore, the scheme of classification represents a convenient technique for the organisation of a large data into groupings which make it much easier for our brains to process the information and see patterns in the distribution of the different types of area (Vickers and Rees, 2007). Amongst the most commonly used area classifications are geodemographic classifications. Geodemographics is the analysis of people by where they live, and works on the principle that the place and population are inextricably linked (Sleight, 2004). Geodemographics can be said to be effective because similar people and households cluster spatially (Vickers and Rees, 2007). Consequently, knowing information about one person enables information about others in that locality to be broadly inferred (Sleight, 2004; Weiss, 2000). Furthermore, geodemographics has a long history of application in retailing (Birkin *et al.*, 2002; 2010). In particular, it can be argued that geodemographics is a shorthand label for both the development and application of area typologies that have proven to be powerful discriminators of consumer behaviour and aids to market analysis (Brown, 1991).

4.3.1 Boundary Data

Boundary datasets define geographical areas and are essential for mapping attribute data that are not released as individual points. For this research, the boundary data will be comprised of a combination of administrative and census boundaries. Nevertheless, in order to achieve this, a considerable amount of data cleaning and manipulation had to be undertaken. For example, the level of geography recorded in the Acxiom Ltd micro data (see Section 4.6) is the postcode level. However, postcodes are not a spatially stable form of geography (Raper *et al.*, 1992), as the building of new housing, commercial or industrial premises leads to changes in the postcode listings. Equally, demolition of property leads to postcodes becoming (temporarily at least) redundant. This causes problems when working with postcode data taken from different reference periods (as is the nature of this research) as the changes to the boundaries are difficult to reconcile with changes in the population (Raper *et al.*, 1992). Additionally, postcode geographies (area, districts and sectors) cannot be uniformly aggregated up into other census geographies and do not contain similar populations across postcodes. Consequently, all responses from the Acxiom data were matched against corresponding Output Areas (OAs) to provide the smallest spatial unit within the 2001 Census boundary system (OAs also used for 2011 Census data dissemination). This was achieved by using the National Statistics Postcode Directory (NSPD) which provides details of the locations of current and historic postcodes along with details of other geographic areas in which each postcode is located (ONS, 2012a). As the micro-level data was delivered for different years, the corresponding NSPD for each year was used to increase the likelihood of a match.

Once all the postcode data within the Acxiom micro data had been converted into OAs, the responses could be cleaned to remove all OAs outside Yorkshire and the Humber and London. This was done for every year of survey data to ensure consistency within the analysis. From this point, other geographies within the census boundary system could be matched to each respondent's OA through a series of lookup tables. The 2001 and 2011 Census boundary structures form a much more appropriate system and consist of a hierarchical subdivision of UK local government areas of various types down to sub-authority areas, such as wards, to lower levels created specifically for census purposes such as OAs. In addition to OAs, Super Output Areas (SOAs) and LADs were also linked to the respondent data. There are two layers of SOA geography – Lower Super Output Areas (LSOAs) and the slightly larger Middle Super Output Areas (MSOAs) as described in Table 4.1. Built from groups of 2001 OAs, SOAs were designed to improve the reporting of small area statistics since they are of a consistent size and have fixed boundaries and more homogenous populations. The comparability and stability of the geography is a key benefit to users of statistics which cannot be provided for other small area geographies such as wards, parishes or postcodes. As such, SOAs were chosen as the smallest level of geography to be used within the regional level analysis (Chapters 6, 7 and 8). It was decided that OA would be too small a geography because it would cause small number problems when using the micro-level data..

Table 4.1 SOA description

LSOA	Minimum population 1,000; mean 1,500. Built from groups of OAs (typically five) and constrained by the boundaries of the Standard Table (ST) wards used for 2001 Census outputs.
MSOA	Minimum population 5,000; mean 7,200. Built from groups of Lower Layer SOAs and constrained by the 2003 local authority boundaries used for 2001 Census outputs.

In addition to the smaller geographic boundary data, LADs/UAs were also chosen for the more aggregate level analysis of GB (Section 4.2.1). It can be argued that a smaller geographic boundary such as Census Area Statistic (CAS) wards would have been more appropriate; however, anything smaller would have been difficult to manage and visualise at the national level. LADs/UAs sit within the hierarchy of administrative areas relating to national and local government as well as the more high-level structure of census geography. The administrative boundary pyramid is complicated, for not only are there several layers, the boundaries of many of the layers in the hierarchy are subject to periodic or occasional change. One recent major reorganisation of local government was in 2009 where ten new UAs were created. This involved the counties of Bedfordshire and Cheshire being abolished and each being split into two UAs. Five complete counties were abolished altogether and created as five separate UAs - Cornwall, County Durham, Northumberland, Shropshire and Wiltshire (ONS, 2012d). Additionally, in

2011, there were also plans to create two new UAs in Exeter and Suffolk although these were revoked by Parliament. In terms of the research for this thesis, because much of the analysis is concerned with pre-recession trends, the original 2001 LAD boundary system with 409 districts will be used instead for consistency.

At this point, it is important to stress that any geographic analysis which organises any data into discrete areal units presents a set of more conceptual problems associated with mapping variables at different scales. These include the Modifiable Areal Unit Problem (MAUP) and the related problem of the ecological fallacy. First of all, the MAUP is associated with the problem of organising data into discrete areal units (Openshaw, 1984), a challenge for spatial analysts since it was first identified by Gehlke and Biehl (1934), and outlined by a number of subsequent authors (Wrigley *et al.*, 1996; Openshaw, 1984). The MAUP contains two problems: the first relates to scale, the second to zoning. It may be evident that patterns identified in data at one geographical scale (number of zones) may not present themselves at a different level of aggregation. Alternatively, two zone systems with the same number of area units may give different patterns. The ecological fallacy emerges from the practice of ‘ecological inference’ described by King *et al.* (2004) and is the problem of inferring something at a lower level of aggregation, from something observed at a higher level.

Whilst it will be impossible to avoid these two issues within the research, provisions will be made to reduce their impact as much as possible. For example, as stated, census geographies will be used because they contain much more uniform populations than say postcodes. Additionally, whenever boundary data or area classifications are used for spatial analysis, the smallest level of geography conceivable will be implemented to retain important spatial patterns. Finally, and most importantly, the thesis will also take advantage of a unique set of individual household data (see Section 4.5) that will not be contained by geographic boundaries.

4.3.2 Output Area Classification (OAC)

The Office for National Statistics (ONS) 2001 Output Area Classification (OAC) groups geographic areas according to key characteristics that are common to the population in that grouping. The classification was produced jointly by the Office for National Statistics (ONS) and researchers at the University of Leeds (Vickers and Rees, 2007) and forms part of a suite of geodemographic area classifications that were produced by the ONS from the 2001 Census. For instance, classifications of LADs (discussed in Section 4.3.3), statistical wards and health areas are also available. However, the OAC, produced at the OA level has a number of advantages over other classifications for a number of reasons. First of all, it is the only classification

accredited as a ‘National Statistic’ and represents a useful tool for identifying key results from the 2001 Census. Furthermore, for geographic analysis, OAs provide a more stable geography and a very fine resolution for data analysis. Additionally, unlike other classification schemes such as Mosaic (Experian), the methodology is fully documented and all the data used in the classification are available from the 2001 Census (Vickers and Rees, 2007). Consequently, this makes it more appropriate for academic research over some of the more up-to-date commercial segmentation packages.

The classification itself was produced using an extensive geographical k-means cluster analysis that identified 41 important variables. These variables were chosen because they were the most successful at creating distinct clusters of people and are listed in Vickers and Rees (2007). Moreover, the OAC partitions each output area into one of 7 ‘Supergroups’, 21 ‘Groups’ and 52 ‘Subgroups’. Table 4.2 provides a list of the classification names and demonstrates how the main ‘Supergroups’ collapse into the more detailed ‘Groups’. The ‘Subgroup’ part of the classification has no cluster name associated with it and is therefore not included. For a more detailed description of the cluster groups, see Vickers and Rees (2007).

Table 4.2. OAC cluster names

Supergroup	Cluster name	Group	Cluster name
1	Blue collar communities	1a	Terraced blue collar
		1b	Younger blue collar
		1c	Older blue collar
2	City Living	2a	Transient communities
		2b	Settled in the city
3	Countryside	3a	Village life
		3b	Agricultural
		3c	Accessible countryside
4	Prospering suburbs	4a	Prospering younger families
		4b	Prospering older families
		4c	Prospering semis
		4d	Thriving suburbs
5	Constrained by Circumstances	5a	Senior communities
		5b	Older workers
		5c	Public housing
6	Typical traits	6a	Settled households
		6b	Least divergent
		6c	Young families in terraced homes
		6d	Aspiring households
7	Multicultural	7a	Asian communities
		7b	Afro-Caribbean communities

It must be noted that an inevitable reservation with this style of geodemographic analysis is the degree of averaging which takes place even when the OAs are relatively small neighbourhoods. ‘Senior Communities’, for example, cannot be expected to completely exclude younger

residents (the ‘ecological fallacy’). Unfortunately however, similar academic classifications of individuals or households were not available for this purpose (see Longley and Singleton, 2009, who suggest a classification of households with specific reference to their online behaviours and Burns (forthcoming PhD) in which a general purpose individual and household classification is currently in development).

4.3.3 Local Authority District Classification

As stated, the analysis of LADs will be carried out for GB to highlight some of the more aggregate level changes happening in the British grocery market. Therefore, in addition to the OAC (associated with the micro-level data), the classification of LADs that has been developed by Vickers *et al.* (2003) will be utilised for the national level analysis. The area classification was also produced using 2001 Census data and assigns each district in the UK to a different ‘Family’, ‘Group’ or ‘Class’ based on a range of socio-economic and demographic characteristics. Other general-purpose district level classifications are also available, such as the three tier system developed by the ONS (ONS, 2004) and the urban-rural classification produced by the Department for Food and Rural Affairs (DEFRA) (DEFRA, 2009). However, once again, the Vickers *et al.* (2003) classification has been selected for this analysis because of its comprehensive and transparent methodology and because it makes a more logical distinction between rural and urban areas than the ONS classification, whilst also separating London and prospering commuter areas from other districts.

4.4 Supply-Side Data: Retailers

In addition to the geographical data, a number of data sources that allow for the analysis of the impacts on the major retailers in the British grocery market will also be utilised. Those which will be used and focused upon the most in the research are discussed below.

4.4.1 Market Share Data

Kantar Worldpanel (formerly TNS Worldpanel) is an international company that deals in consumer knowledge and insights based on continuous consumer panels. Through market monitoring, advanced analytics and tailored market research solutions, Kantar Worldpanel analyse what people buy, what they consume and the attitudes behind this behaviour (Kantar Worldpanel, 2012). More specifically, every month, Kantar releases in-store sales figures for the previous twelve weeks for the main retailers in the British grocery market. These data come from a panel which monitors the household grocery purchasing habits of 25,000 demographically representative households in GB. The value of items, bought by these

consumers is also adjusted for inflation and represents a consistent way to measure monthly grocery market share figures for GB that go as far back as 2007. As such, these data will be used regularly to monitor the national performance of the main grocery retailers through the course of the economic downturn. In addition, in order to gain a more detailed geographic perspective, data will be provided by Acxiom Ltd at regional and various sub-regional geographies on the main retailer households conduct their weekly shop. The Acxiom data are collected at the household level and thus can be used to estimate grocery 'market share' statistics for various retailers at detailed spatial scales.

4.4.2 Store Location Data

Data on the location and type of grocery stores in GB were obtained from GMAP Ltd, a subsidiary of Callcredit Information Group. GMAP are a leading provider of market intelligence, retail planning and predictive modelling solutions for major retail organisations. The data are purchased by GMAP from commercial market research organisations such as Retail Locations Ltd and Panorama. In this instance, grocery retailers are here defined as those selling food, non-edible groceries and varying ranges of non-food products, depending on the size format. The data include the store fascia (e.g. Asda and Tesco Metro) store location (postcode) and store size (square foot). In order to analyse the major supply-side changes in the grocery market through the most recent period of economic downturn, data were obtained for 2002, 2004, 2006, 2008, 2010 and 2012. In addition, GMAP Ltd also provided limited regional (Yorkshire and the Humber, and London) market share data produced from their in-house Store Forecast Models (SFM). The data are estimated based on a combination of client data, official statistics and trade reports and will form part of the process for validating revenue forecasts using Acxiom data in Chapter 8.

To ensure consistency and compatibility across the time periods, a certain amount of data cleaning was undertaken. More specifically, the postcode data recorded for each store was cleaned and matched to the NSPD so that the x and y national grid coordinates could be obtained. Moreover, once the postcode values had been cleaned, it was possible to match the selected census geographies and area classifications described in Section 4.3. In addition, where certain stores had missing square foot values, the median value was used to fill in the blanks. The mean store size was discounted as it was found to be susceptible to outliers (unusual small or large stores compared to the rest of the data). Filling in the missing store sizes also allowed for the stores to be classified into the main four sectors (IGD, 2012): convenience stores (less than 3,000 sq ft); supermarkets (3,000-25,000 sq ft); superstores (25,000 – 60,000 sq ft) and; hypermarkets (above 60,000 sq ft).

4.4.3 Employment and Business Survival

The final two datasets are concerned with the employment and survival of businesses in GB. First of all, The Business Register and Employment Survey (BRES) will be used to demonstrate the level of employment within different sectors and the level of effect caused by the economic downturn. The BRES replaces two existing surveys, the Business Register Survey (BRS) and the Annual Business Inquiry (ABI). The BRES has two purposes: collecting data to update local unit information and business structures on the Inter-Departmental Business Register (IDBR) and producing annual employment statistics which are published via the Nomis website (ONS, 2012e). The BRES is a key data source for analyses of business activity. The selection criteria are GB trading businesses registered for Value Added Tax (VAT) and/or Pay-As-You-Earn (PAYE). It records an annual sample of around 82,000 businesses, with estimates available down to LSOA and Scottish data zones (ONS, 2012e). There is no gender split recorded in the data, however figures are available by employment type and industry. Industry type is detailed by the five-digit level 2007 Standard Industrial Classification (SIC). Nevertheless, because the ABI data were only available at the four-digit class, there are some time-series issues when going back before 2007.

In conjunction, the Business Demography data will be utilised to assess the impact of the recession on the survival of businesses in the economy. The data forms part of the annual collection of structural business statistics within the IDBR which have been collected on a voluntary basis since 2002 (ONS, 2012f). The Business Demography data include births (a business that was not present in the previous two years), deaths (a business that was no longer present in the active file) and survivals (a business that was a birth in the specified year and has survived to the next year and onwards) of GB enterprises (an active enterprise is one that had turnover and/or employment at any time during the given year) (ONS, 2012f). As with the BRES, the data are detailed by the 2007 SIC which makes them useful for assessing survival rates across different sectors. Additionally, information is also given at district level which will allow for detailed geographical analysis from a national perspective.

4.5 Demand Data: Official Sources

Data on household demand are essential for analysing the impact of the recession on household consumption. Whilst the primary source of demand data will come from Acxiom's ROP (Section 4.6), a number of other sources will also be utilised. These data will either be used to help validate the Acxiom data or be used in areas of study that the ROP does not cover. Consequently, Section 4.5 will concentrate on a variety of official data sources that are used to measure changes in demand across GB.

4.5.1 Census of Population

Every decade in the UK since 1801 (with the exception of 1941 due to World War II and 1966 when a 10 per cent sample was taken), a census of population has been conducted and collated by the ONS in England and Wales and the General Register Office (GRO) in Scotland. Historically, the census has provided the base for many of the population and socio-demographic statistics across the UK, providing comparable information from the national to the local level on a range of topics, and acting as a benchmark for many other statistics. To date, it still remains the most comprehensive survey of population in the UK and thus an extremely valuable academic resource. Nevertheless, despite providing such a wealth of detailed information, the most recent 2011 Census may well be the last to be administered across the UK if the Conservative/Liberal Coalition Government decide to go through with their plans to scrap any future censuses in favour of alternative means of counting the population and collecting information about its composition (see Section 4.5.2). Reasons for abolishing the 2021 Census include the high costs of data collection (estimated at around £480million in 2011), a more mobile population and the increasingly complex ways in which people live make the process of taking a census more difficult, and the decadal nature of the census make the data collected less timely than would be ideal (ONS, 2011a).

The majority of the census data used in this research, particularly at small-area geographies will come from the 2001 Census of Population. This is because when most of the research was conducted, large amounts of the recent 2011 Census data were not available. For more information about the census in general, see Rees *et al.* (2002b). Regardless of the wealth of information on the composition and location of the population, the census does not contain any information on household income or expenditure. Furthermore, it only represents a one-off cross-sectional static measure which makes it unsuitable for any type of time-series analysis. As such, census data will be primarily used to calculate the number of households within a given area and assess the strength of the Acxiom data for use in academic research. At various points, the research will utilise the aggregate census area data from 2001 and 2011 (where available), the Small Area Microdata (SAM) and the Mid-Year Estimates (MYEs). The SAM represents a five per cent sample of individuals from the 2001 Census and is the most comprehensive official micro-level dataset available on the British population (CSSR, 2010). Conversely, MYEs are the annual population estimates for England and Wales, published at a variety of geographic scales (LSOA is the smallest). Whilst these data are essentially estimates, MYEs represent a more up-to-date picture of the nation's population. The 2001 Census data are rolled forward each year using a ratio change methodology calculated from administrative sources as an indicator of change in the true population (ONS, 2011b).

4.5.2 Household Surveys

On account of the 2021 Census having a high likelihood of being abolished, the ONS established the 'Beyond 2011' Programme in April 2011 to take a fresh look at the alternatives to running a census in 2021. The Beyond 2011 Programme (ONS, 2011a) is carrying out a full consultation and assessment of alternative approaches in order to allow the UK Statistics Authority (UKSA) to make a recommendation in 2014 to Parliament as to the best way forward. The primary aim of the initiative will be to identify how the range of alternative data available, collected through various official sample survey sources, can be collated and used to provide detailed information about small areas and neighbourhoods that have traditionally been core outputs from the census (ONS, 2011a). Those sample surveys of most relevance to this research include the Living Costs and Food (LCF) survey, the Labour Force Survey (LFS), the General Lifestyle Survey (GLF) and the English Housing Survey (EHS) which all form components of the Integrated Household Survey (IHS).

With regard to their use in this thesis, the LCF survey will provide one of the main sources of information on household expenditure and will be used in combination with the micro-level Acxiom data for individual household analysis. The LCF collects information on spending patterns through the Classification Of Individual COnsumption by Purpose (COICOP). This is an internationally nomenclature developed by the United Nations Statistics Division to classify and analyse consumption expenditure incurred by households, non-profit institutions serving households and general government according to their purpose (EuroStat, 2011). The primary use of the survey is to provide information about spending patterns for the Consumer Price Indices (CPI), and about food consumption and nutrition (Fortin, 1995; Blundell *et al.*, 1999). The survey is conducted throughout the year across the whole of the UK. Originally named the Expenditure and Food Survey (EFS), the survey was created in 2001 through combining the National Food Survey (NFS) and the Family Expenditure Survey (FES). It was then renamed the Living Costs and Food (LCF) survey in 2008. As a result of these changes, time-series data on certain variables can be problematic. Moreover, as much of the information in the LCF is collected through a written diary and privacy reasons prevent access to the entire dataset, causing certain variables to not be available from one year to the next (ONS, 2009; ESDS, 2009a). Nevertheless, the detailed nature of the expenditure data captured across all spending categories make it a useful data source for analysing trends in consumer spending.

In conjunction, the other sample surveys mentioned (LFS, GHS, EHS and BHPS) will only be utilised along with the 2001 SAM to assess the robustness of the Acxiom data (Section 4.6). This is because the level of expenditure data collected within these surveys is limited; however,

based on their reputation in academic research in comparison with the other data collected, they still provide a solid foundation to compare against the ROP. The LFS provides detailed information on labour market characteristics such as participation, income, training and qualifications, but nothing on consumption or expenditure (Dennett *et al.*, 2007; Blundell and Etheridge, 2009). Alternatively, the purpose of GHS has been to document the major changes in households, families and population which have occurred over the last 30 years. The main themes within the survey are household and family information, housing tenure and accommodation, consumer durables including vehicle ownership, employment, education, income and health (National Statistics, 2003). The EHS, which replaced the Survey for English Housing (SHE) and the English House Condition Survey (EHCS), only really collects a range of demographic and socioeconomic data. In addition, the BHPS was replaced by a new longitudinal survey in 2009 called Understanding Society (Buck, 2010). Being longitudinal the data are based on the same sample every year, which means that one can construct measures of change, for example in household structure, residential mobility, income and employment history (ESDS, 2009b). With regard to questions on consumption, the BHPS is restricted to questions relating to expenditure on durables, housing, demographics and income (Easaw and Herav, 2009; Blundell and Etheridge, 2009).

4.5.3 National Accounts and Economic Output

The final set of data sources that will be incorporated into the research concerns the data recorded at the national level to measure the performance of the British economy. In the context of economic output, the HouseHold Final Consumption Expenditure (HHFCE) estimates produced by the ONS will be used to measure all expenditure on goods and services in GB. In order to obtain the most complete coverage of expenditure a number of administrative survey sources are used in the compilation of the HHFCE estimates. However, the two largest sources of data are the LCF and the Retail Sales Inquiry (RSI). The Retail Sales Inquiry is a monthly survey of 5,000 retail businesses including all 900 'large retailers' and 4,100 'small and medium retailers' on a sampled basis (ONS, 2011c). This corresponds to the inclusion of approximately 75 per cent of retail sector turnover each month. Additionally, the figures are produced in line with the COICOP classification and are released on a quarterly basis. This frequent distribution of the statistics makes for a valuable dataset when trying to understand changes triggered by a recession, as many of them will be short-term.

In addition, it has already been established in Chapter 2 that the rate of inflation has an effect on the cost of goods. Therefore, so that realistic comparisons can be made between different years the rate of inflation will be factored into analysis whenever possible. The rate of inflation is measured in two ways, through the Consumer Price Index (CPI) and Retail Price Index (RPI).

Whilst both the CPI and RPI represent the change in price of an average consumer's purchase of basket of goods and services, each is slightly different in the combination of goods and services it covers and how it is calculated. The CPI is designed to measure the change in the average level of prices paid for consumer goods and services by all private households in the country. Over 50,000 prices are collected for a representative basket consisting of over 1,000 different items from the 12 group headings from the COICOP classification. With each rebase of the CPI, the coverage of goods and services is reviewed to ensure that it continues to be representative of consumer tastes and purchasing practices. In comparison, the RPI includes certain housing costs, such as council tax, mortgage interest payments, buildings insurance and house depreciation, whilst the CPI includes certain financial service charges like stockbrokers' fees.

4.6 Acxiom Research Opinion Poll (ROP)

The penultimate section in this chapter will discuss, assess and verify the data provided by Acxiom Ltd as part of a partnership formed by the Economic and Social Research Council (ESRC) through the Retail Industry Business Engagement Network (RIBEN). The main data source that will be discussed is the annual Research Opinion Poll (ROP) – a household level survey designed to capture local variations in consumer behaviour across GB. The ROP data has been made available to this research through the delivery of survey extracts (two per year) between 2004 and 2012 for GB. Moreover, the aggregate data which is also discussed has been provided for GB at LSOA and LAD level between 2005 and 2011.

Academics tend to be sceptical about commercial datasets that are collected and processed by private sector organisations. They doubt the provenance of such data, worry about sampling bias and data quality issues, and prefer the comfort of using data from well-established sample surveys or censuses designed to capture details of every household. Yet there are ever growing volumes of unofficial data being captured through a number of different channels by different organisations which, with shrinking public sector funds, over time will become increasingly useful for social science research. Therefore, before the ROP dataset can be used for 'serious research' in an academic context, an important set of issues relating to its authentication and validation must be confronted. Surprisingly, despite the comprehensive use of secondary data sources in social science research, the literature concerning validation is relatively modest. Nevertheless, Stewart (1984) and Sorenson *et al.* (1996) make an attempt to address the main issues of importance regarding the use of a secondary data through a set of questions for which answers are required. Additionally, as part of the 'Beyond 2011' programme, there is also a major remit to assess the suitability of private sector data to be used along with other survey data after the 2011 Census (ONS, 2011a). Consequently, to ensure an inclusive discussion, a number of the questions and criteria set by Stewart (1984) and Sorenson *et al.* (1996) for

analysing secondary data sources are combined with the criteria for assessing the statistical options of data from the ONS 'Beyond 2011' programme. Through doing this, a framework is formed much like that of the 'Total survey error' structure - a conceptual framework aimed at describing statistical error of sample survey statistics (Grover, 2010). The aim will be to independently validate the data recorded via the ROP on factors such as the purpose of collection, the methodology, the frequency of collection, the geography, the content and accuracy of the data, and its credibility (ONS, 2011a; Sorenson *et al.*, 1996; Stewart, 1984). Furthermore, where possible, to provide context, comparisons will be made with the 2001 Census and some of the more established national sample surveys mentioned in Section 4.5. It is worth pointing out that, whilst this following discussion will be thorough, readers are also directed to Thompson *et al.* (2010b) for a more detailed discussion of the ROP and its data.

4.6.1 Research Area

As part of the framework created to assess the validity of the ROP data, we first consider the research area of the survey. In doing so, we will reflect on the credibility of Acxiom as the data owner, the purpose of the survey, what information is actually collected and the level of consistency in the survey.

Acxiom Ltd are a global leader in interactive multi-channel marketing services, the mission of the company is to transform data collected from different sources (such as questionnaires or official registers) into actionable information which helps its clients understand their customer preferences, improve customer acquisition and retention, predict consumer behaviour and locate optimum retail sites (Błaszczyszynski *et al.*, 2006; Acxiom, 2012). When the data collected through an array of sources are pooled together, the company's central database houses information on over 60 per cent of UK inhabitants including their geographic location, age, income, address, spending habits and various lifestyle choices. The main source of data which feeds this central database is the company's ROP survey. Delivered every year across GB, the household survey, completed by an individual member of the household, provides the microdata that are the foundation for most of Acxiom's data packages and, in essence, what the company refer to as their 'holy grail'. The data represent a source of information which no other company or organisation can provide, and combined with the quick turnaround of the raw data into outputs, it means that Acxiom can provide a very sizable survey of the national population each year.

Credibility and Survey Purpose

In terms of data credibility, it does not matter how good the credentials of the agency responsible for collecting the data are, there must always be a degree of healthy scepticism

about both the reliability and the validity of the data (Stewart, 1984). Acxiom is recognised for being a world leader in data services and has been termed by John Meyer, a former company chief executive, as “...*the biggest company you have never heard of*” (The Telegraph, 2009b). This is not surprising considering Acxiom’s unique selling point is built on the collection of large volumes of sensitive consumer data across a range of topics in a number of countries across the world. For collecting survey data in the UK, the company has twenty years of experience in the design and structure of the questionnaire each year. The Data Acquisition team within Acxiom has a remit to check the design and layout of all surveys, allowing Acxiom to test the responsiveness of particular factors on an annual basis, ensuring the various components of the survey perform in an optimum manner. The various factors tested include: the months in which people are most responsive; the type of people that are most responsive; individual question placement and wording to maximise response; the questions most suitable to place upfront (to encourage survey completion); Data Protection Act (1998) issues such as sensitive questions; questions that cannot be asked and additional Data Protection Act wording (e.g. ethnicity); return address (a regional postal return address is more responsive); prize draw offers and survey incentives; and survey size, style, font and type of paper used. This work is crucial to the whole process as the final survey must be one which will maximise the response rate and generate the most accurate results.

Acxiom is a profit-making organisation and therefore the purpose of the survey is to collect data that other organisations will want to purchase. Consequently, it is in the company’s best interest to produce data to the highest degree of accuracy possible. The main aim of the survey is to gather detailed and up-to-date information on consumer spending habits, preferences, socio-demographic information and the respondents’ geographic locations. The combination of these different pieces of information allows for detailed insights into the spending patterns of different ‘types’ of people and geographic areas. This allows clients that utilise the data to better understand and retain their existing customers, and locate new ones. Additionally, to guarantee that the survey is profitable, Acxiom provides a mechanism for clients to place their own questions on the survey. These are termed ‘sponsored’ questions because their existence on the survey is paid for by the client. Sponsored questions are not ideal for time-series analysis since once the client stops paying for their inclusion on the survey, the questions are removed. Nevertheless, the majority of the questions are devised by Acxiom and asked consistently so that continuity over time for key variables can be maintained. These core questions typically feed into the construction of Acxiom’s products and appear on each survey because Acxiom is committed to providing data which will support time-series analysis. Therefore, all changes to the survey that may impact on time-series analysis are stringently reviewed so that the ROP can provide a unique source of data on demographic and socio-economic changes across GB.

What Information are Collected?

In addition to the survey purpose, it is essential for the secondary data analyst to establish exactly what topics the survey covers (Stewart, 1984). Table 4.3 indicates the number of questions and sections in each ROP survey between 2004 and 2010. The sections are listed in the order in which they appeared on the survey for each year. Whilst this thesis will primarily make use of the grocery data, it is evident from Table 4.3 that the ROP offers a large number of questions across a range of different areas (e.g. expenditure, demography, health and geography). For example, in 2010, the survey had 141 questions spread across 29 different sections.

Table 4.3. ROP questionnaire structure, 2004-2010

Year	Questions	Sections	Section Contents
2004	147	8	Hobbies & Activities; Shopping; Personal Care; About Your Home; Computer/Internet; Smoking; Motoring; You and Your Family.
2005	163	14	Hobbies & Interests; Shopping; Drinks; Smoking; Pets; You & Your Family; Motoring; Charities; Family Health; TV & Telephone; Computing & Internet; About Your Home; Financial Planning; Information Guides.
2006	148	22	Groceries; Hobbies; Shopping; Your Interests; Drinks; Your Home; Outgoings; Your Occupation; Charities; You & Your Family; Pets; Family Health; Motoring; Financial Products; TV & Telephone; Computing & Internet; Local Area; Tobacco; Financial Planning; Planning Your Future; Information Guides.
2007	136	25	Groceries; Shopping; Newspapers; Hobbies; Books; Home; Home Improvements; Your Local Area; Occupation; Outgoings; Financial Products; You & Your Family; Motoring; Cars; Charities; Family Health; Telephone & Internet; Shopping Channels; Leisure; Entertainment; Pets; Tobacco; Financial Planning; Retirement; Education.
2008	133	27	Groceries; Shopping; Newspapers; Hobbies; Entertainment; Environment; Home; Home Improvements; Your Local Area; Charities; Occupation; Business Owner; You & Your Family; Family Health; Health Concerns; Outgoings; Internet; Telephone & TV; Financial Products; Financial Planning; Holidays; Pets; Education; Tobacco; Leisure; Motoring; Cars; TV Viewing.
2009	130	26	Groceries; Shopping; Your Local Area; Hobbies; Newspapers; Coffee; Insurance; Environment; Internet & TV; You & Your Family; Occupation; Outgoings; Home; Leisure; Financial Products; Charities; Telephone; Credit Crunch; Financial Planning; Family Health; Technology; Education; Cars; Pets; Tobacco; Shopping Vouchers.
2010	141	29	Groceries; Shopping; Coffee; Hobbies; Home; Home Improvements; Insurance; Household; Outgoings; You and Your Family; Family Health; Financial Products; Charities; Occupation; Your Local Area; Internet; Telephone; Technology & TV; Financial Planning; Environment; Research; Animal Welfare; Leisure; Tobacco; Education; Skills; Cars; Newspapers; Shopping Vouchers.

Nevertheless, whilst Table 4.3 provides useful insight into the type of information collected by the ROP, it is important to understand how the types of questions offered in the ROP differ from those offered in other household surveys. Therefore, as a way to assess the suitability of the information collected through the ROP for wider social science research (not just household consumption), a list of key variables that would traditionally be used to describe the main attributes of a given population are provided in Table 4.4. To ensure a comprehensive list was compiled, a combination of the primary variables selected for the ONS OAC classification by Vickers and Rees (2007) and the assessment of population and migration statistics by Raymer *et*

al. (2012) are used. Additionally, on account of the wealth of expenditure information recorded in the ROP, a number of key expenditure variables are examined across the selected surveys as well. It is clear from Table 4 that the ROP performs weakest with the demographic variables. Whilst the main demographic variables are collected (age, gender, etc.), there is a lack of information being gathered on the respondent's country of birth, religion and sexual identity. Their omission is probably due to the sensitive nature of having these questions on a voluntary survey; even the 2001 Census did not contain any questions on the last of these variables. In comparison, the surveys which make up the IHS contain a wealth of demographic variables, in particular the LFS which includes all of the major variables selected for comparison.

As the ROP primarily collects information at household level, it performs strongly on the selected variables for housing and household characteristics. More specifically, there are only two variables from other surveys which do not exist on the survey (number of rooms and central heating). The absence of a central heating variable is not uncommon as it is also not available across many of the other surveys. In addition, the ROP also includes information which the other surveys do not. For example, it records the respondent's previous address and whether the household has an Internet connection. Both these variables provide an element of added value to the ROP. Having information on the previous address of the respondent will allow for detailed insights into internal migration at a time when migration is a topical issue (Travis, 2011, Thomas *et al.*, 2012). Furthermore, with average weekly value of Internet retail sales in 2011 rising to £536.5 million and making up approximately 9.6 per cent of total retail sales (ONS, 2011d); it will be important in social science research to know which households have an Internet connection. Moving onto the socioeconomic variables, the ROP once again performs strongly. The ROP provides all the main variables such as qualifications, smoking and health, whilst also offering information on expenditure, shopping channels used, holiday destinations, hobbies and debt. It is only really the LCF which can match the ROP in its range of socioeconomic indicators as the other surveys are limited in this area. The final section in Table 4 covers the employment variables which provide information on the country's labour force. Overall, all the surveys including the SAM provide most of the variables likely to be used for comparison. Unsurprisingly, the LFS has the most complete coverage. The SAM covers the least amount of variables as the 2001 Census did not record household income on the survey. Alternatively, the ROP has a good range of employment variables and even records the location of the respondent's place of work. In the context of journey to work analysis, this variable would be extremely useful as it can be difficult to obtain this information from other sources.

Table 4.4. Common variables associated with social science research

	ROP	SAM	GLF	LCF	LFS/APS	EHS	BHPS
Demographic							
Age/DOB	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nationality	<i>Partial</i>		Yes	Yes	Yes	Yes	
Country of birth			Yes	Yes	Yes	Yes	Yes
Year arrived in UK			Yes	Yes	Yes	Yes	
Ethnicity	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Religion		Yes	Yes	Yes	Yes	Yes	Yes
Sexual identity			Yes	Yes	Yes	Yes	
First language	<i>Partial</i>				Yes		Yes
Housing and household composition							
Marital status	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of time at address	Yes		Yes	Yes	Yes	Yes	Yes
Previous address	Yes						Yes
Number of cars/vans	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Total number in household	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent children	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tenure	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of bedrooms	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of accommodation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of family unit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Central heating		Yes	Yes				Yes
Internet connection	Yes			Yes			Yes
Socioeconomic							
LLTI and general health	<i>Partial</i>	Yes	Yes	Yes	Yes	Yes	Yes
Smoking	Yes		Yes	Yes	Yes	Yes	Yes
Qualifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic class (NS-Sec)		Yes	Yes	Yes	Yes	Yes	
Drinking	Yes		Yes	Yes			Yes
Expenditure	Yes			Yes			Yes
Debt	Yes		<i>Partial</i>	<i>Partial</i>	<i>Partial</i>		<i>Partial</i>
Hobbies	Yes		Yes	Yes	<i>Partial</i>		<i>Partial</i>
Financial products	Yes		<i>Partial</i>	Yes			
Shopping channels	Yes			<i>Partial</i>			
Wellbeing and opinions	<i>Partial</i>						<i>Partial</i>
Charity contributions	Yes			<i>Partial</i>			
Holiday destination	Yes			Yes			Yes
Area classification	Yes			Yes			
Geography (LAD and below)	Yes	Yes			Yes		Yes
Employment							
Hours worked			Yes	Yes	Yes		Yes
Currently studying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Economic activity	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupational group	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income	Yes		Yes	Yes	Yes	Yes	Yes
Pension scheme membership	Yes		Yes	Yes	Yes	Yes	Yes
Benefit entitlement	Yes		Yes	Yes	Yes	Yes	Yes
Location of employment	Yes				Yes		

In addition to the range and suitability of the questions asked on a survey, we must also consider the consistency and any substantial changes which may have occurred over time (Stewart, 1984). This is because, for time-series analysis, the consistency of the questions asked on any survey is crucial. The ROP has evolved substantially since the early 1990s as its commercial utility has increased. Furthermore, to ensure the ROP collects relevant and as up-to-date information as possible, new sections and questions are regularly introduced. A prime example of this is the ‘Credit Crunch’ section added in 2008 to collect data specifically on the impact of the financial crisis which began in 2007 (Nesvetailova and Palan, 2008; Langley, 2008). Nonetheless, Acxiom recognises that, commercially, it makes sense to have a consistent dataset and has therefore made every effort since 2004 to keep the questions and methodology consistent. Conversely, Acxiom cannot control for the sponsored questions paid for by external organisations. Once an organisation decides it no longer wants a question on the ROP, Acxiom will usually withdraw the question.

Consistency

The ROP is not the only survey to have some consistency issues; the other surveys mentioned have also undergone a number of administrative and methodological changes which can affect time-series analysis. For instance, many of the selected surveys amalgamate to form modules within larger, centralised surveys which have changed over time. As mentioned, the IHS developed by the ONS in 2008 integrates the LCF, LFS, GLF and the EHS. The aim of the IHS is to bring together a number of key questions asked across a range of social surveys conducted by ONS. This is achieved through a set of ‘core’ questions asked in the individual surveys which are then deposited on the IHS, while a number of ‘bolt on’ questions which are not included in the IHS are reported in the individual surveys (Raymer *et al.*, 2011). However, following the first reported results for 2009/10, some ‘core’ questions were dropped and it has been reported that the GLF will be phased out from autumn 2012. As Walthery (2011: 3) comments, “...it is expected that the composition of the IHS will be flexible with some surveys leaving the IHS and others entering each year”. Details of changes to the other household surveys have already been mentioned in Section 4.5.2.

4.6.2 Responsiveness

A number of different factors also impact on the responsiveness and bias in any secondary data source. These include the response rate (Sorenson *et al.*, 1996), the sampling framework used to collect the data, the sampling unit and the level of geographic detail (Stewart, 1984).

Survey Delivery

The ROP is delivered in the form of a survey to households across GB, because when dealing with a large sample, the questionnaire is an indispensable tool when primary data are required about people, their behaviour, attitudes and opinions (Hay, 2005). Although the primary sample unit is the household, the ROP also collects information about families and individuals. The survey is rolled out twice a year, initially in September and then in the following January. September and January are chosen specifically because extensive research by ROP found that the greatest response rate occurs in these months. During this time of year, respondents are more likely to complete the survey forms because bad weather and decreasing levels of daylight mean people are at home and indoors for more of the time than they would be during the spring or summer months.

The survey is delivered through two channels. The main channel is direct mail which provides a controlled and reliable method to survey a large number of households (Bradburn, 2004). To ensure all parts of the country are surveyed, Acxiom use a variety of sources, with the national Postcode Address File (PAF) providing the main source for the sampling framework. The PAF overcomes problems of under-representation of specific subgroups because it samples addresses, not people, and, unlike the Electoral Register, does not depend upon self-registration (Raper *et al.*, 1992); it is also frequently updated and has a coverage of 28 million households in the UK (Royal Mail, 2012). It is restricted, however, to those addresses which receive fewer than 25 pieces of mail a day, which means it excludes some private residences that act as small businesses (Stewart, 1984). The second channel is the Internet, as the ROP is replicated online to reach respondents less willing to fill in paper-based surveys. The responses are also immediately digitised which heavily reduces the processing time. Despite the advantages of using two channels, there is an issue (although rare) of households responding more than once in a year via the paper and online survey. Therefore, Acxiom has technology in place which allows the company to create a 'single customer view' of each household that responds to the ROP. Once a household replies to the survey, it is assigned a unique identification number. Therefore, when Acxiom receive a response, they know who and where it has come from and can check if it has duplicates in the same year.

During the collection process, Acxiom use a number of techniques to entice more responses and improve the quality of the data. For instance, every ROP delivered also includes a small pen to encourage the respondent to answer the survey straight away. Furthermore, Acxiom makes every attempt to ensure that the questionnaire 'caters for' each 'local area' within which it is distributed. For example, the first page of the survey has various statistics from the previous year drawn from the answers given by residents in the same locality. This may encourage

participants to respond as they can see that other people's views on their neighbourhood are being taken seriously and put to use. In addition, the survey predominantly contains closed questions because these are easy for respondents to answer, to code and to standardise and the data lends itself easily to statistical analysis (Fink, 1995). Open-ended questions are generally avoided because their responses are more difficult to code and interpret. The wording of questions and potential answers are also kept relatively formal. This is because formal responses are believed to trigger a respondent to focus on the task of formulating precise answers (Morse, 1994; Ongena and Dijkstra, 2009). In addition, as many of the questions ask for quite sensitive information, Acxiom has traditionally adopted a funneling technique, one which follows a gradual movement towards personal matters (Dunn, 2005). This means that personal information such as age, ethnicity, income and health are left to the end of the questionnaire. Respondents are also reassured that they do not have to provide answers to these more sensitive sections of the questionnaire. Incentives are also used as participants are offered the chance to receive both financial rewards and prizes upon completion of the questionnaire. However, this may also increase the number of false records as respondents rush through the survey just to have a chance of receiving a prize. As a result, Acxiom use the positioning and wording of certain questions to provide a form of quality assurance by helping to identify errors and false entries created by random ticking. For example, if a respondent ticks the 'no internet connection' box, checks would be made to identify whether or not any questions relating to the household's online shopping habits from home have been ticked.

Once the ROP survey has been completed by a household, the form is returned via a free post envelope which comes with the survey. The return address is regional, which makes the survey appear more personalised to local areas and the responses can be housed at a number of collection points in different regions across GB. After waiting for a period of approximately eight weeks, all of the received surveys are sent off to a data processing company in Manila, Philippines. In the past, the responses were simply keyed into the computer and to reduce the likely event of errors, 'double keying' was used so that comparisons could be made between the two entries. Any differences or inconsistencies in the data would result in a survey being re-entered. However, this method was extremely inefficient, resulting in an extended wait for the final dataset. Consequently, the use of Optical Mark Recognition (OMR) was introduced to speed up proceedings and scan the survey questionnaires on the computer. OMR is commonly used when high-volume data entry is required (Curtis and Cobham, 2008). Once all responses have been scanned into the system, the data are sent back to the Acxiom data processing centre in Normanton, England. The ROP surveys completed online are also sent straight to Normanton to be combined with the paper-based responses. This entire process happens twice a year. The

first batch of surveys sent out in September are available as raw counts by November, then the second half distributed in the coming January are available in the same format by March.

Accuracy and Degree of Completeness

The sample size and the frequency of any survey are also crucial indicators of its reliability and utility. Thus, Figure 4.4 demonstrates the average number of household responses received for each of the household surveys mentioned. In the context of household surveys, the SAM in fact has the greatest sample size with just short of 3 million household responses. Nevertheless, because the SAM represents a 5 per cent sample of individuals drawn from the 2001 Census (CCSR, 2010) for all countries of the UK, it is only a one-off static measure in time. Therefore, because the SAM cannot be used for time-series analysis, it is excluded from Figure 4.4. The SAM aside, with an annual sample of around 1.1 million households, the ROP is the largest annual survey in GB and the largest population study outside of the Census of Population. Additionally, as parts of the survey also capture information on both the household reference person and their partner, this increases the sample size for certain variables to over 2 million individuals. The LFS has the next largest sample, with each quarterly wave based on 60,000 household responses covering 126,000 individuals. This gives the LFS an annual household sample of about 240,000 households (Rees *et al.*, 2002; Blundell and Etheridge, 2009). The GHS, BHPS EHS and LCF all have similar samples sizes between 5,500 and 25,000 households (Dennett *et al.*, 2007). Like the LFS, the LCF is also run on a quarterly basis, providing an advantage over the ROP with regards to the potential offered for time-series analysis of seasonal variations.

In addition to the sample size, it is also important to know the demographic profile of any secondary data (Sorensen *et al.*, 1996; Deaton, 2000), since all surveys contain an inherent bias within the sample population. For example, with regard to the ROP, the Household Reference Person (HRP) that fills out the majority of the questions must be a minimum of 18 years old. However, there are questions which record the information of other members of the family, including children. In comparison, the HRP for the LCF only has to be 16 years old, but again, some parts of the survey also provide information on children between 7 and 15 years old (ESDS, 2009a). The LFS also includes 16+ year olds, but it has a cap of 65 years which means that socioeconomic data on the very elderly are not collected. The SAM provides the most comprehensive demographic coverage, as it includes information on the entire family (all ages) as well as institutional populations. In the same way as the ROP, the BHPS is based only on adults.

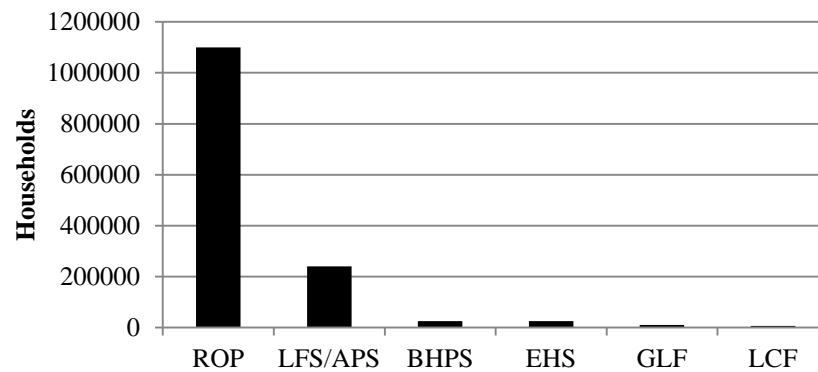
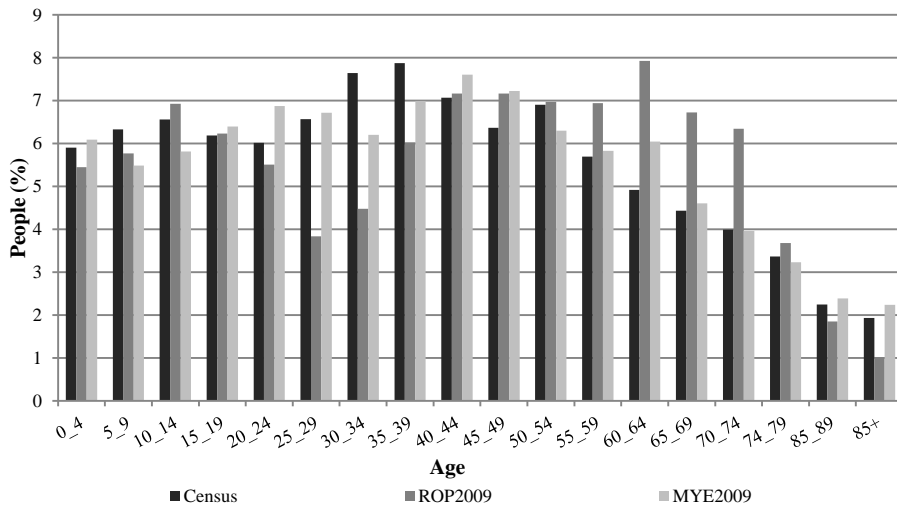


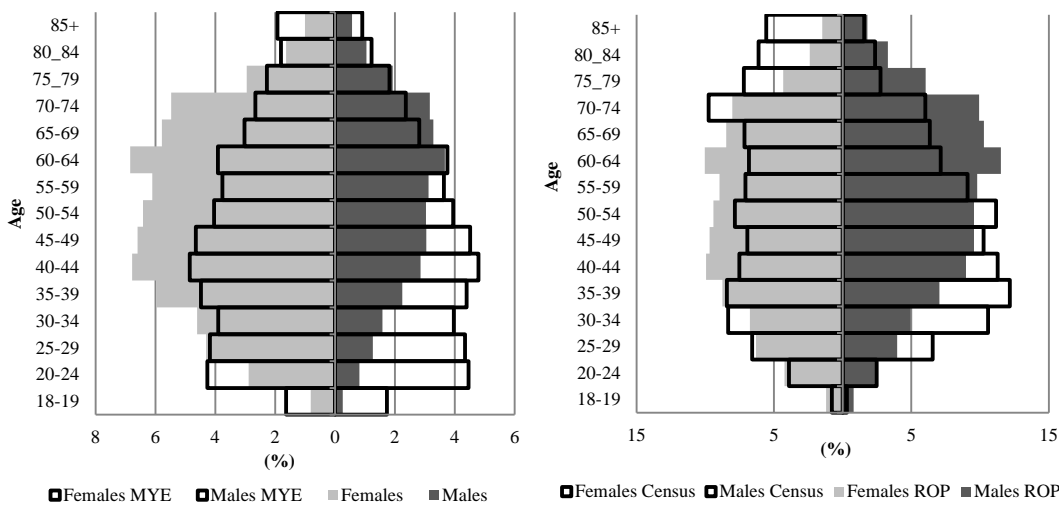
Figure 4.4. Count of households in selected UK sample surveys

Source: Acxiom Ltd (2011); ESDS (2011)

As a way to identify any demographic bias in the ROP, Figure 4.5(a) portrays the age structure of all the respondents recorded in the January 2009 ROP survey, the percentage of respondents by age from the 2001 Census and the age ranges for 2009 ONS Mid-Year Estimates (MYEs). Overall the three datasets show a consistent trend of high proportions in young children, low proportions in young adults, high percentages in older adults and low percentages in the elderly. It is worth noting, however, that the percentages for each age group from the ROP fit closer to the 2009 mid-year estimates proportions than the 2001 Census data. This is encouraging, as it shows that structural changes (ageing population) occurring in the population are picked up in the ROP data (ONS, 2010). However, when compared to the 2009 MYEs, it is clear from Figure 4.5(a) that the ROP has an under-representation of people in the age groups below 40 years old and there is over-representation for the age groups between 50 and 75 years old. Additionally, Figure 4.5(b) exemplifies the level of bias within the sample by dividing the number of people in each age and gender category by the total sample. In Figure 4.5(b), it is evident that there is an over-representation of females in the sample, especially for ages between ages of 40 and 70 years. In comparison, men provide a smaller part of the sample, with the most difficult group of all to capture being young males aged 18 to 24 years. This is not unique to the ROP, as Frosztega (2000) recognises this group as traditionally the hardest to reach in sample surveys. Moreover, because the ROP is essentially a household survey, Figure 4.5(c) displays the HRP population by age and gender for the 2009 ROP and the 2001 Census. The results in Figure 4.5(c) are encouraging, as the population pyramids for the two datasets are relatively consistent. For instance, the gender differences in Figure 4.5(c) are not as defined and the proportions for younger respondents are far more representative of the actual population. Nevertheless, there is a noticeable non-response bias for the elderly. Again, this is an issue documented as a widespread problem (Redpath, 1986; Holt and Elliott, 1991), but which rarely has a significant effect on analysis. On account of the varying levels of bias, those groups less likely to respond are over-sampled to try and increase the number of respondents through ‘door-drop campaigns’ and through the online ROP, which is useful for targeting younger age groups.



(a) Age profile for 2001 Census, 2009 ROP and 2009 MYEs



(b) ROP 2009 and MYEs 2009

(c) ROP 2009 HRP and 2001 Census HRP

Figure 4.5. A comparison of the 2009 ROP sample with the 2001 Census and 2009 MYEs for GB

Source: UK Census (2001); Acxiom Ltd (2009); ONS (2009)

In addition to age-gender bias, geography also represents an important facet of any secondary dataset (ONS, 2011a). Table 5 provides information on the geographic coverage of selected surveys for comparison, along with the level of geographic detail assigned and available for each of the household responses. The LFS, LCF, SAM and BHPS cover the whole of the UK whereas the ROP and BHPS exclude Northern Ireland, and the EHS is run for England only. When comparing the lowest level of geography assigned to each of the household respondents, the ROP comes out as superior by a long way. The ROP household data are captured at address level. As this is the lowest form of geographic detail, the ROP microdata are free from the MAUP (Openshaw, 1984). Furthermore, the data can be aggregated up to any other set of

geographic units (administrative or census). In comparison, the SAM and BHPS are both available at LAD level while all of the other continuous household surveys only provide household data GOR level.

Table 4.5. Geographic coverage and most detailed level of geography available for household surveys

Household Survey	ROP	LFS	SAM	LCF	GHS	EHS	BHPS
Geographic Coverage	GB	UK	UK	UK	GB	England	UK
Lowest level of Geography	Address	GOR	LAD	GOR	GOR	LAD	LAD

Missing Data

Another important issue associated with the completeness of any data source is the existence of missing or blank fields in the data (non-response). For each single variable, “...it should be considered whether missing information means that exposure or outcome has not taken place or whether the variable represents a missing value” (Sorensen *et al.*, 1996: 438). As stated, sample surveys provide a biased representation of the total population unless. In some of the government surveys (e.g. BHPS, LCF, GLF, SEH, LFS), missing data are dealt with by using assigned weights to correct for the non-equal probability of selection of respondents, and differential response rates within the group of selected individuals/households. In terms of the ROP, no weighting is conducted at the individual level. This is because of the large sample it generates, which means that even small associations will give statistically significant results during analysis (Sorensen *et al.*, 1996). Instead, the blank fields are left for the end user to decide how best to interpret the missing information. Nevertheless, Acxiom’s aggregate products are put through a rigorous process of weighting and manipulation to produce a number of different aggregated data products. The three main packages sold to clients include the Acxiom Population Estimates (APE), the Aggregated Data (AD), and PersoniX Acxiom’s geodemographic segmentation profile. It is not possible to discuss the weighting process in this instance, as the procedure remains confidential. This problem is not unique, as Sorensen *et al.* (1996) recognise it as one of the major issues when using any secondary data source. However, it can be confirmed that the weights are calculated using published UK statistics from the ONS such as the 2001 Census, MYEs and the LCF. Table 4.6 displays the level of non-response bias for selected variables. The age and accommodation variables contain a similar amount of blank fields as only a small proportion of households decided to withhold their information. Household income is arguably a more sensitive piece of information for somebody to divulge, which explains the higher rate of blank fields for this question. Nevertheless, more than 75 per cent of households still disclosed their annual household income.

Table 4.6. Blank fields for selected variables in ROP data for GB, 2009

	Respondents	Postcode	Age	Income	Accommodation
Blanks	n/a	0	76,776	174,411	89,247
Percentage	n/a	0	8.35	22.40	9.87
Total cases	1,000,701	1,003,265	919,476	778,619	904,224

Source: Acxiom Ltd (2009)

4.6.3 Records

Due to the fact that survey data are secondary sources, there are a number of considerations and questions which must be addressed with regard to accessibility, confidentiality, the format of the data and the possibility of record linkage with other datasets (ONS, 2011a; Sorensen *et al.*, 1996).

Accessibility and Confidentiality

Sorensen *et al.* (1996) recognise the importance of financial costs when using secondary data. Unfortunately, because Acxiom is a private organisation, its products are only available at a cost. However, as the company provides bespoke data packages, the company is flexible in terms of the cost. Furthermore, with regard to academic use, there could be an opportunity to use the data for research purposes at little or no cost through an agreed partnership similar to the one with the School of Geography at the University of Leeds. This is the obvious drawback when comparing the ROP to the data collected through the various ONS surveys, as the data are available at no cost to the majority of academic institutions.

The confidentiality of a dataset is crucial when considering the appropriateness of a dataset for research, especially where information about the general public is concerned. People will be less likely to relinquish personal information if there is a worry that the data might be acquired by a third party. This is why public acceptability and risk form a fundamental component of the 'Beyond 2011' assessment. The Census Act and the ONS' commitment in general make clear that details about any one individual are never divulged (ONS, 2011a). Therefore, to guarantee respondent information collected through the ROP survey is kept confidential, the data are kept under the highest levels of security at the data processing centre in Normanton. Furthermore, extreme care is taken when the data are delivered to clients. The data can be accessed a number of ways, however due to the large size of the data files, File Transfer Protocol (FTP) is often the favoured method and is the standard network protocol used to transfer files from one host to another host over the Internet. To connect to the FTP site, a user name and password is given to the client beforehand. Once the data have been successfully downloaded a second password is required to access the folder containing the data. This type of online system whereby a

username and password is required is common practice. For instance, census data and the components of IHS can be accessed through the Economic and Social Data Service (ESDS) hosted by the University of Essex. Parts of the LFS can also be downloaded through nomisweb and EuroStat.

Data Format and Record Linkage

The format of any dataset is an important factor to consider as the construction of any survey database is a socially negotiated exercise (Stewart, 1984). Survey records can be formatted or structured in such a way that their use is made difficult for research (Sorensen *et al.*, 1996). For example, the data files may not be compatible with certain software packages or the data might contain an inappropriate format of variables (age bands). The ROP microdata can be delivered in a range of formats to suit a variety of software packages (.dat, .txt, .sav, .csv and .xls). Furthermore, similarly to many of the official household surveys, the responses are coded numerically, with each number referring to a value in an accompanying data dictionary.

As stated, one of the reasons for exploring the use of data from administrative sources is because of the potential benefits that can be gained from record linkage (Sorenson *et al.*, 1996). The ONS Methodology Directorate has a team dedicated to working on record linkage methodology which has become involved in many record linkage projects. For example, there is a project to link the APS database to Individual Learner Record data (Heasman, 2008). However, because record linkage involves combining data on a respondent captured in multiple surveys through a common identifier (e.g. date of birth, address or National Insurance Number), it can be problematic. For instance, the recorded data must be standardised across datasets if it is to be matched, otherwise considerable cleaning of the data is required. Regarding the ROP, record linkage is possible with the ROP because very detailed information is collected such as name, date of birth and a complete address. As using a person's name may breach confidentiality issues, using a combination of the address and date of birth may be more appropriate. For instance, in this thesis, by using the postcode of each respondent recorded in the ROP, it was possible to append a variety of area classifications (OAC), economic indicators (deprivation indices) and the grocery store data provided by GMAP Ltd (Section 4.4.3).

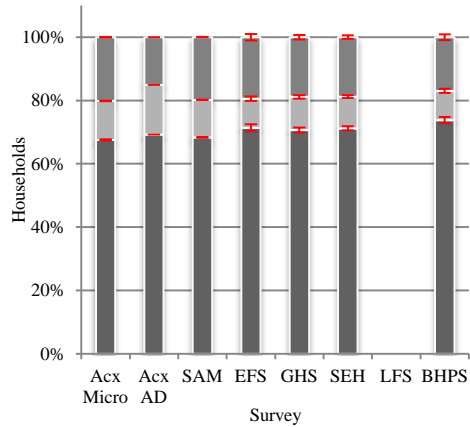
4.6.4 Representativeness and Robustness

This final section concentrates on providing a comparison between some of the core variables in the ROP against those in selected sample surveys, as it is relevant when analysing a secondary dataset to know the distribution of the data for key variables (Sorenson *et al.*, 1996).

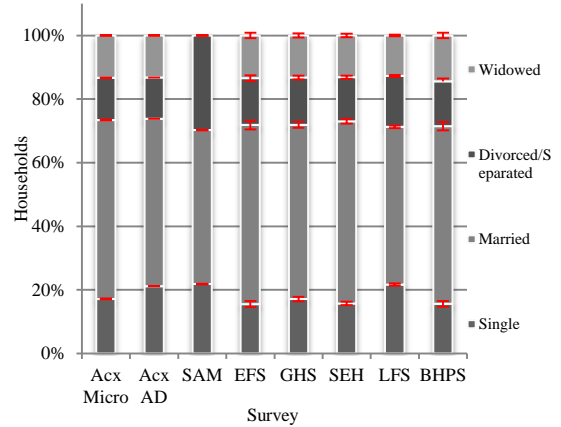
Descriptive Analysis

Figure 4.6 contains a group of bar graphs displaying the proportions of households in each survey according to household tenure, marital status, ethnicity, gross annual income and GOR within GB. The data are from 2005 so that realistic comparisons from the annual surveys can be made back to the SAM. Using the most recent data would have been problematic given the various demographic and socioeconomic changes over the last ten years. Confidence intervals of 95 per cent based on survey sample size have also been included (error bars) to help provide a measurement of reliability for the survey proportions. First of all, it is clear from Figure 4.6(a) that similar proportions are found within the different tenure categories for each of the datasets. The only noticeable difference is what appears to be a slight overrepresentation of owner occupied households in the BHPS. However, this may in fact just be reflecting the growth in home ownership since 2001. Figure 4.6(b) displays the percentage of HRP's by marital status. Once again, all sources capture the same patterns in terms of the overall internal distribution. The Acxiom micro data, EFS, GHS, SHE and BHPS all have very similar figures. The LFS and the SAM exemplify slightly higher proportions for single HRP's. It is worth noting however that the confidence intervals associated with both Acxiom datasets (across all graphs in Figure 4.6) are much smaller than the other surveys on account of the large sample size. Only the SAM has smaller error bars.

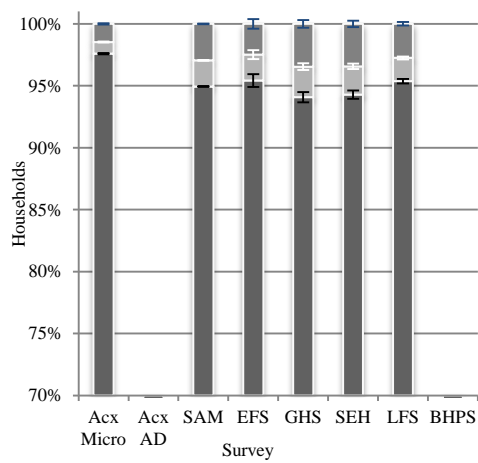
It is evident from Figure 4.6(c) that the HRP ethnicity proportions have a more diverse pattern than any of the other core variables. The vertical axis on this graph has been altered to range from 70 to 100 per cent to account for the overwhelming percentage of white people in GB, which makes the differences appear slightly exaggerated. Moreover, the confidence intervals are coloured differently to help distinguish between overlapping error bars. Unfortunately, the BHPS and Acxiom AD (can be produced as a custom variable on request) do not provide the ethnicity of the HRP so cannot be compared. In comparison, the Acxiom microdata and GHS have much lower levels of Asian and Black respondents. This is surprising considering these two ethnic groups have witnessed the most growth since 2001, albeit small (ONS, 2006). One can assume that the ROP has a bias towards white households in the sample. Ethnic minorities are much harder to engage in voluntary surveys on account of the language barrier and the fact they can be far more marginalised from mainstream society (Gibson *et al.*, 1999; Sheldon *et al.*, 2007). Nevertheless, when considering the size of the ROP sample, the absolute counts of non-white respondents are still much higher than other surveys.



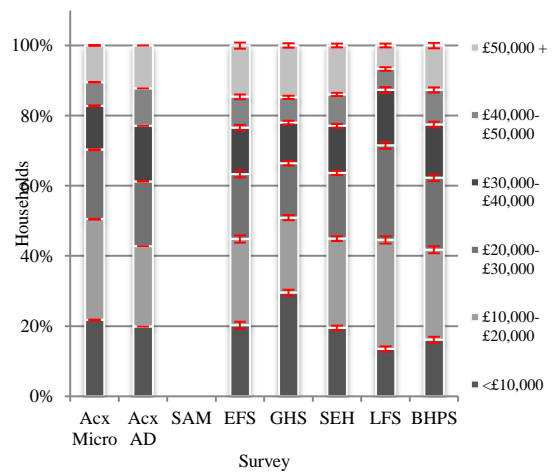
(a) Tenure



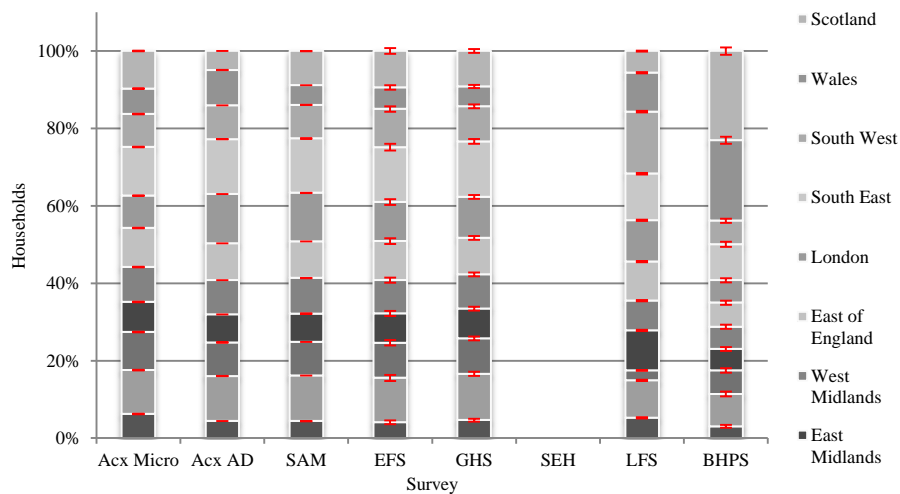
(b) Marital Status



(c) Ethnicity



(d) Income



(e) GOR

Figure 4.6. Univariate comparison between 2005 Acxiom data from the ROP and other official surveys in GB.

Sources: SAM (2001); Acxiom Ltd (2005); APS (2005); HIS (2005); BHPS (2005)

Figure 4.6(d) represents the proportion of households in each of the various annual household income bands. The 2001 Census did not ask an income question so no comparison can be made. The Acxiom datasets show good comparability with the EFS, GHD and SEH. Furthermore, it is evident when comparing the Acxiom microdata to the AD that there has been some adjustment to increase the number of households in the top income band. The top earning income group is the hardest to reach with these types of optional surveys (Gibson *et al.*, 1999). Figure 8(f) shows the proportions within GORs and demonstrates a high level of consistency across all surveys apart from the BHPS (SEH not displayed as only for England). Once again, this is encouraging for using the Acxiom data as the geography of the British population also appears to be captured reliably within the data.

Logistic Regression

Finally, in order to add a greater level of sophistication to the analysis, we can use binary logistic regression to investigate the likelihood of households spending more than £50 a week on groceries, controlling for a range of explanatory variables (age, income, tenure, household size). An equivalent set of models are also run using data from the LCF (only survey to record grocery spend) to determine whether the ROP displays similar or dissimilar patterns. A similar strategy is applied by Stillwell *et al.* (2010) to assess the robustness of different datasets in modelling the likelihood of employment for individuals. However, given that the focus of this research is on the British grocery market, modelling grocery expenditure is more appropriate.

Logistic regression has many similarities with linear regression, but linear regression cannot be used in this case because the outcome variable (grocery spend) in the ROP is recorded categorically. The logistic regression equation expresses the linear regression equation in logarithmic terms (called the logit) and thus overcomes the problem of violating the assumption of linearity (Field, 2009). The exact form of the equation can be expressed in multiple ways, however in this case equation 4.1 expresses the probability of Y occurring (the probability that a household belongs in a certain grocery spend category).

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_{1i})}} \quad (4.1)$$

where e is the base of natural logarithms, b_0 is the constant, x_1 is the predictor variable and b_1 is the coefficient (weight) attached to the predictor.

In terms of the defined model, the binary response variable (weekly grocery expenditure) is represented as $Y = 1$ when household weekly shop is £50 or more, and when $Y = 0$ when it is below £50 a week. Additionally, crucial to the interpretation of logistic regression is the value of the odds ratio ($\exp(B)$), which is an indicator of the change in odds resulting from a unit change in the predictor (equation 4.2). If the odds ratio is greater than 1, then it indicates that as the predictor increases the odds of the outcome occurring increases. Conversely, a value less than 1 indicates that as the predictor increases, the odds of the outcome occurring decreases.

$$\Delta \text{ odds} \frac{\text{odds after a unit change in the predictor}}{\text{original odds}} \quad (4.2)$$

The outputs of the binary logistic regression models are shown in Table 4.7. The various predictor variables were selected through the findings from Chapters 2 and 3. Each variable includes the odds ratio of spending more than £50 (about average) for each category of a variable compared with the reference/base level (the first category for each variable). An odds ratio greater than one means a household in that category is more likely to spend £50 and above than the base level and *vice versa* for odds ratios of less than one. In this instance, the data are for 2011 and include households within GB. Table 4.7 also displays odds ratios for data from Axiom's ROP and the Government's LCF (the most comparable survey in terms of the type of data collected).

In terms of income, compared with households earning an annual income less than £10,000, the logistic regression model using the ROP data shows increasing odds ratios for each of the consecutive income groups. A similar pattern is also seen in the LCF data, suggesting consistency between income and grocery spend in both datasets. In addition, across both surveys, persons who are in couples are significantly more likely to spend more than £50 a week on groceries than persons who are single. The model for car ownership would suggest for both datasets that those households with a car, in particular more than two cars, are significantly more likely to spend above £50 a week on groceries than those without a car. It could be argued that income may be having an impact here, as households with increased income can afford more cars. However, accessibility is also known to impact on grocery spend, something which will be explored in Chapters 5 and 6.

Household size, unsurprisingly also has a significant impact on weekly grocery spend (increasing odds ratios with larger household size). Whilst both datasets display similar patterns, the relationship is more pronounced in the LCF data. Moving on to the ethnicity models, the

LCF data produced results which were not significant across each of the categories. This was also the case for Black and Other ethnic groups in the ROP model. This could be because ethnicity does not have a significant impact on grocery spend. However, the most likely reason is that the surveys do not necessarily have large enough numbers of non-White ethnic groups in their samples, a common problem in sample surveys (see Section 4.6.2). The only significant results to report are that the Asian ethnic group were found to spend more on groceries than the White (reference group) and Other ethnic groups (also found in LCF model but not significant). On observing both the marital status logistic regression models, all the results are significant. Moreover, consistent with the literature, 'Couples' spend more on their weekly grocery spend than households termed 'Single' or 'Other' (mainly widowed and divorced).

The final two models use the ONS OAC. In this instance the 'constrained by circumstances' group was used as the reference category as it is perceived to be the most deprived supergroup. The results from Table 4.7 indicate that all the results are significant and thus reliable conclusions can be made. Additionally, despite demonstrating slightly different odds ratios, both the ROP and LCF data present similar patterns. First of all, odds ratios are only slightly higher for the 'multicultural' supergroup, suggesting similar levels of grocery expenditure - although this relationship is less pronounced in the LCF model. Next, the 'blue collar communities' and 'typical traits' supergroups also show increased odds ratios and are not too dissimilar from each other. Moreover, the 'countryside' and 'prospering suburbs' groups (least deprived) show increased odds ratios further still, with 'prospering suburbs' showing the highest. Interestingly, in the ROP model, the 'city living' group has the lowest $\exp(B)$ value, which would suggest this group are less likely to spend more than £50 a week than those households termed 'constrained by circumstances'. In comparison, in the LCF model, 'city living' does have one of the lowest odds ratios but it is still higher than the reference category. Nevertheless, even with inconsistencies such as this, brought about by varying sample sizes, survey purpose and coverage, in the main, consistent conclusions from the logistic regression models can be drawn regarding the relationship between income, age-group, car ownership, household size, ethnic group, marital status, OAC and grocery spend.

Table 4.7. Modelled odds ratios of spending £50 or more on groceries a week, 2011

	Acxiom ROP					LCF			
	95% C.I. for EXP(B)					95% C.I. for EXP(B)			
	Sig.	Exp(B)	Lower	Upper		Sig.	Exp(B)	Lower	Upper
<£10,000 (income)	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
£10-19,000	.000	2.29	2.19	2.39	.000	2.55	2.19	2.97	
£20,-29,000	.000	4.37	4.15	4.61	.000	4.67	3.99	5.46	
£30-39,000	.000	6.35	5.94	6.78	.000	7.44	6.31	8.79	
£40-49,000	.000	9.16	8.34	10.06	.000	9.96	8.31	11.93	
£50,000+	.000	15.10	13.51	16.88	.000	14.46	12.31	16.98	
18-29 years	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
30-39 years	.000	1.85	1.72	1.99	.000	2.53	2.14	2.99	
40-49 years	.000	2.14	2.00	2.29	.000	3.86	3.28	4.55	
50-59 years	.000	1.47	1.38	1.57	.000	3.03	2.57	3.58	
60-74 years	.000	0.89	0.84	0.94	.000	2.14	1.82	2.51	
75+ years	.000	0.39	0.37	0.42	.405	<i>0.92</i>	<i>0.77</i>	<i>1.11</i>	
none	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
1 car	.000	1.76	1.70	1.81	.000	2.67	2.39	2.99	
2 cars	.000	5.59	5.32	5.87	.000	8.12	7.17	9.19	
3+ cars	.000	7.77	6.92	8.74	.000	13.56	11.00	16.72	
1 person	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
2 person	.000	5.18	5.00	5.36	.000	9.88	6.11	15.99	
3 person	.000	10.09	9.43	10.79	.000	11.65	6.77	20.05	
4+ person	.000	10.12	8.92	11.48	.000	30.12	17.46	51.98	
White	.002	1.00	1.00	1.00	.000	1.00	1.00	1.00	
Black	.055	<i>0.83</i>	<i>0.69</i>	<i>1.00</i>	.000	0.45	0.33	0.62	
Asian	.007	1.17	1.04	1.32	.727	<i>1.04</i>	<i>0.83</i>	<i>1.31</i>	
Chinese	.022	0.58	0.36	0.92	.095	<i>0.58</i>	<i>0.30</i>	<i>1.10</i>	
Other	.285	<i>1.13</i>	<i>0.90</i>	<i>1.42</i>	.158	<i>0.79</i>	<i>0.58</i>	<i>1.09</i>	
Single	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
Couple	.000	4.21	4.03	4.40	.000	9.47	8.24	10.87	
Other	.000	1.19	1.14	1.25	.001	1.30	1.11	1.52	
Constrained by Circumstances	.000	1.00	1.00	1.00	.000	1.00	1.00	1.00	
Multicultural	.011	1.10	1.02	1.18	.000	1.70	1.38	2.09	
Blue Collar Communities	.000	1.56	1.49	1.63	.000	1.80	1.56	2.09	
Typical Traits	.000	1.52	1.46	1.60	.000	1.80	1.54	2.07	
Countryside	.000	1.89	1.79	2.01	.000	2.71	2.31	3.18	
Prospering Suburbs	.000	2.03	1.93	2.13	.000	3.03	2.61	3.51	
City Living	.011	0.88	0.79	0.97	.003	1.38	1.12	1.72	

Note: Odds ratios in italics are not significantly different from the reference category

Sources: Acxiom Ltd (2010-2011); LCF (2010- 2011)

4.7 Conclusions

The aim of this chapter has been twofold. First of all, attempts were made to provide a comprehensive review of the various datasets that will be used in the thesis. This began with a discussion on the range of geographical datasets that will be utilised, before moving onto the different supply and demand sources. It was important to document the various sources of information so that the analysis displayed in the following chapters can be conducted with clarity and transparency.

The second and most important aim was to provide a review and validation of Acxiom's ROP survey. This source of data will form a major part of the analysis and has rarely been used in academia so it is crucial that a thorough and independent assessment of the data was provided. In order to achieve this, a framework was devised by combining the criteria set by Stewart (1984) and Sorenson *et al.* (1996) for analysing secondary data sources with the standards for assessing the statistical options of data from the ONS 'Beyond 2011' programme. Overall, even with the shortcomings mentioned (bias in data); there is no doubting that the ROP provides a unique source of up-to-date information on consumer behaviour and expenditure patterns, with massive potential for use in academic research. Moreover, by helping to reshape our understanding of a wide range of human behaviours, the data has the potential to address many economically crucial questions across the social sciences not just the grocery sector. On this basis, and with the support of the 'Beyond 2011' programme, it is without question that commercial data sources such as Acxiom's ROP will become ever more apparent in social science research. In the past, official sources of secondary data such as government surveys have been considered to have greater dependability and credibility. However, even official government data has its issues, often presented in a way to support hidden agendas (Lancaster, 2005).

Chapter 5

Great Britain in Recession: A Modern History of Food Retailing

5.1 Introduction

The combination of Chapters 2 and 3 have provided a comprehensive review of both the recession and the long-term structural trends impacting upon retailing in Great Britain (GB) - detailing how the retail landscape (specifically the grocery market) has evolved from the post Second World War recovery period up to the present day. By 2012, a wealth of literature on food retailing has been generated, documenting and analysing the changes during the second half of the twentieth century that have shaped today's market. Nevertheless, it is evident from the literature that there remains a relative shortage of academic research on the spatial expansion of British food retailers both domestically and internationally since the work of Langston *et al.* (1997, 1998) and Poole *et al.* (2002). Burt *et al.* (2010) and Elms *et al.* (2010) to provide a more recent picture, but there is still the absence of any in-depth spatial analysis of changes at the local level. Furthermore, whilst much of the research focuses on the supply-side changes, little has been done to integrate supply with the geography of retail demand. Thus, given that one of the principal aims of this thesis is to understand changes in the food retail market since the beginning of the twenty-first century, it seems logical to pick up the commentary where the literature review in Chapter 3 stops. For reasons of parsimony, the discussion is predominantly restricted to the activities of the main food retailers, although examples will be drawn from other groups where relevant.

The chapter will begin by reflecting upon the performance of the food retail industry through the recent recession (Section 5.2). Initially, the food sector will be placed in the context of the wider economy, so as to establish its performance in terms of output, employment and market share. Thereafter, a detailed spatial analysis of household expenditure on groceries will be provided in Section 5.3. This will help identify how different areas have responded to the recession with regard to the actual amount spent on food, whether there has been any 'switching behaviour' by consumers between different retailers (customer patronage) and how the role of

e-commerce now fits into the grocery market. Section 5.4 will then provide a detailed analysis of supply-side changes in the grocery market since 2003. Consideration will be given to the changes in store numbers and floorspace, store formats and distribution channels. Where possible, analysis will be given at Local Authority District (LAD) level as a way of providing the greater level of geographic detail which is missing in recent analysis. Finally, concluding remarks are given in Section 5.5 and a short summary of the major findings are presented.

5.2 The British Food Retail Market in Recession: The Wider Economy

Chapter 2 has already provided a detailed examination of the literature surrounding the development and primary impacts of the economic downturn since 2008. Whilst this provided useful context in terms of the overall impact of the recession, a more detailed analysis of these indicators with regard to the food retail industry is required to ensure that the complete picture is understood. This is because the impacts witnessed at the national level are by no means representative of the trends occurring within the various sub-sections of the economy. It is for this reason that Section 5.2 will concentrate on placing the impacts of the recession in the food retail industry in the context of the wider economy with regard to output, the labour market and market concentration.

5.2.1 Household Expenditure

The first part of this chapter is concerned with analysing the impact of the recession on the different sectors which comprise the national economy. From a definition perspective, the economy can be divided into a number of sectors and markets through a variety of classifications. However, for reasons of consistency, in this section the analysis will be based on Household Final Consumption Expenditure (HHFCE) data recorded using the Classification Of Individual Consumption by Purpose (COICOP) – see Chapter 4. Using this classification allows for an expansion on aggregate levels of GDP which only record output in broad sector groups. Furthermore, as household expenditure contributes to more than 60 per cent of UK GDP (Fender, 2011), the HHFCE data also provides a useful proxy for economic performance.

Figure 5.1 exemplifies the top level of the COICOP classification with respect to HHFCE with the inclusion of ‘net tourism’ (UK tourist expenditure abroad less foreign tourist expenditure in the UK) so that the estimates are representative of national expenditure rather than just domestic levels. The data are also seasonally adjusted to account for seasonal effects on consumption and recorded at current prices to reflect the monetary value or the nominal price at which certain goods and services are currently being sold in the economy. In addition, Figures 5.1(a) and

5.1(b) provide a distinction between annual trends for 2002-11 and quarterly trends from 2007 Q1 – 2012 Q1. The annual data are useful in attempting to identify more long-term patterns, whilst the quarterly data enable a more detailed perspective of recent market changes.

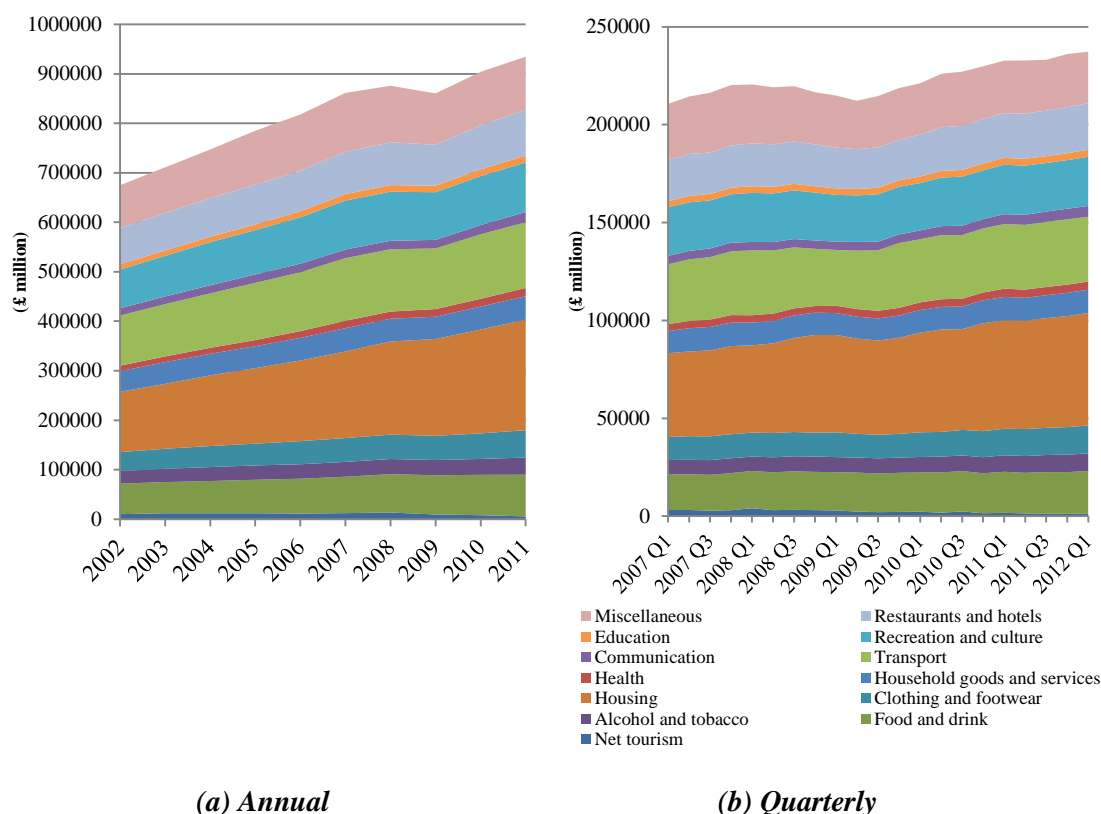


Figure 5.1. UK Seasonal adjusted HHFCE at current prices by COICOP classification

Source: ONS (2012a)

In terms of total expenditure, Figure 5.1(a) highlights that annual expenditure has increased steadily each year from 2000 until 2008. However, between 2008 and 2009, output fell by 1.75 per cent after a year of growth (1.66 per cent) between 2007 and 2008. In absolute terms, the decline in 2009 represents a fall of about £14,314 million. A more detailed analysis of this period using the quarterly data is presented in Figure 5.1(b) and demonstrates that the fall in expenditure actually occurred between the third quarter of 2008 and the second quarter of 2009. This period falls directly in the middle of the recession, so it is of no surprise that households reduced their overall expenditure in response to the harsh financial conditions. Since then, household expenditure at current prices has increased going into 2011. Again, this is reflected in Figure 5.1(b), as household expenditure is shown to rise steadily into 2012.

Alternatively, it is also important to break expenditure down into various categories, for households have historically reacted differently in terms of the amount spent on the range of goods and services they need to purchase during harsh economic conditions (Song, 1995; EEA,

2005; Jackson and Papathanasopoulou, 2008; Chitnis and Hunt, 2009; Chamberlin, 2010). Therefore, through the various COICOP classifications, the graphs in Figure 5.1 also provide a more disaggregated picture of household expenditure. It is clear to see that the proportion of household expenditure spent on each group differs largely. For example, 'housing' represents the area of household consumption which generates the most money for the economy, followed by 'transport' and 'recreation and culture'. At the lower end of the scale, the amount generated by household spend on 'net tourism', 'health' and 'education' is much lower. This is to be expected considering 'housing' covers rental/mortgage costs and 'transport' includes the amount spent on fuel, areas of expenditure which are costly and essential parts of everyday living. Furthermore, given that a large proportion of people in GB are provided with free health care and education, one would also expect these categories to generate low levels of expenditure. In terms of the recession, at current prices, expenditure on 'net tourism', 'clothing and footwear', 'health', 'transport', 'communication', 'recreation and culture', 'hotels' and 'miscellaneous' all suffered a decline in growth at some point between 2007 and 2011. In particular, 'net tourism', 'household goods and services', 'restaurants and hotels' and 'transport' declined the most. Nonetheless, apart from 'net tourism' the rest of these groups increased in terms of overall expenditure between 2010 and 2011, whereas expenditure on 'food and drink', and 'alcohol and tobacco' have increased annually uninterrupted since 2000.

In comparison, the trends in Figure 5.1 are not necessarily replicated in the expenditure data based on chained volume measures in Figure 5.2. Figure 5.2 relates to the same data as Figure 5.1, however, it has been adjusted to account for inflation. This is done by computing the production volume for each year in the prices of the preceding year, and then 'chain linking' the data together to obtain a time series of production figures from which the effects of price changes have been removed (ONS, 2012a). This manipulation thus illustrates consumption expenditure on a goods or services resulting from a change in the quantity purchased, rather than a change in the price of that good (or service). As additional context, Table 5.1 highlights the change in the Consumer Price Index (CPI) for each COICOP classification from 2005 (index year) to 2012. The compilation of the CPI is discussed in more detail in Chapter 4. However, in simple terms, the CPI is designed to measure the change in the average level of prices paid for consumer goods and services by all private households in the country. It should be noted that in this instance, 'net tourism' data are not included as the price of foreign holidays is not necessarily impacted upon by inflation in the UK. It is clear from Table 5.1 that whilst inflation for all goods and services has risen year on year, the level of inflation within each grouping is somewhat different. For example, 'education' (tuition fees), 'housing' (rising energy costs), and 'food and drink' have seen large rises in inflation since 2005 compared to

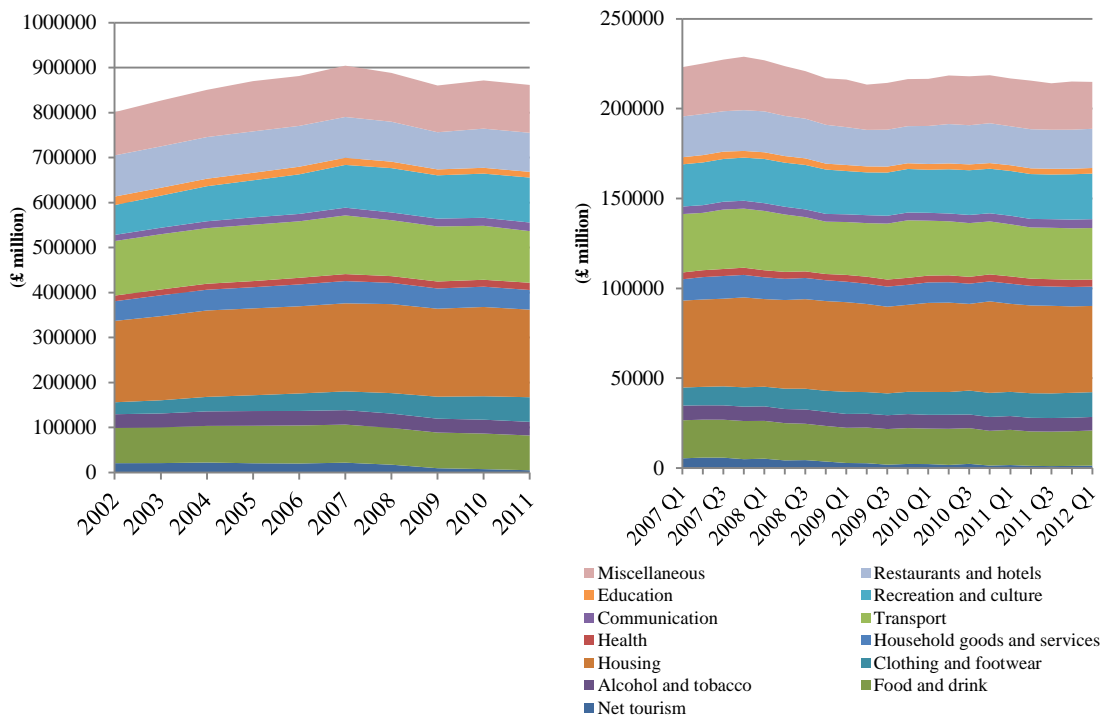
‘clothing and footwear’, ‘communication’ and ‘recreation and culture’ which have actually declined at certain points.

Table 5.1. CPI by COICOP classification, 2005 to 2012

	2005	2006	2007	2008	2009	2010	2011	2012
Food and drink	100	103	107	117	123	127	134	138
Alcohol and tobacco	100	103	106	110	115	122	132	139
Clothing and footwear	100	96	92	86	80	79	81	81
Housing	100	109	115	125	130	130	138	143
Household goods and services	100	100	101	103	107	110	115	118
Health	100	103	106	109	112	116	120	123
Transport	100	103	106	112	113	122	132	134
Communication	100	100	97	94	95	100	104	107
Recreation and culture	100	99	98	97	99	100	100	100
Education	100	107	122	136	147	155	163	168
Restaurants and hotels	100	103	107	111	114	117	122	125
Miscellaneous	100	104	106	109	111	114	117	119
Total expenditure	100	102	105	109	111	114	120	122

Source: ONS (2012g)

On account of the inflation data in Table 5.1, Figure 5.2(b) demonstrates a somewhat different economic trend. Despite showing a similar period of uninterrupted year-on-year growth throughout 2002 to 2007 as in Figure 5.1(b), household expenditure then declines between 2007 and 2008 by £14,263 million as shown in Figure 5.2(b). This is followed by another decline in output in 2009 before the market recovers temporarily with growth of 1.31 per cent in 2010. Figure 5.2(b) shows how household expenditure has fluctuated somewhat since 2010. More specifically, whilst there was an increase in total expenditure between the last quarter of 2010 and the last quarter of 2011, every other quarter between 2010 and 2012 has recorded negative growth in terms of household expenditure. The worst period within this timeframe came between the first and third quarter of 2011, with three consecutive periods of decline in household expenditure. This period of low consumer confidence was ultimately the trigger for the economy slipping back into recession during the first quarter of 2012 (double-dip). These differences in measuring economic output highlight the need to use both sources of data as a way of understanding consumer behaviour. For instance, whilst households have increased their total expenditure, the actual volume purchased has declined.



(a) Annual

(b) Quarterly

Figure 5.2. Seasonally adjusted HHFCE at chained volume measures by COICOP classification in the UK (2009 prices)

Source: ONS (2012a)

As stated, total expenditure declined in 2008, again in 2009, recovered in 2010 before falling again in 2011. However, this trend is not consistent across the COICOP groupings. More specifically, ‘clothing and footwear’ and ‘communication’ did not contract at all annually, whilst the other groups have witnessed a level of decline at some point between 2007 and 2011 (Figure 5.2(a)). Those categories which have been predominantly affected are ‘net tourism’, ‘household goods and services’, ‘hotels and restaurants’, ‘transport’ and ‘education’. In particular, households appear to have heavily reduced the level of expenditure on ‘net tourism’, suggesting that during harsh economic climates, expenditure on tourism becomes less important. Furthermore, with regard to transport, this would imply that while households are spending more due to rising fuel costs (Table 5.1), households have actually cut back on the amount they are consuming. This could be down to shorter car journeys and increased fuel efficiency in modern cars. Other sectors such as ‘food and non-alcoholic drinks’ and ‘housing’ have declined slightly but on the whole have remained relatively constant between 2008 and 2011. This is because households cannot reduce expenditure hugely on these areas as they form an essential part of living (consistent with Howard and Sheth, 1969). Instead, in the home, expenditure is reduced slightly by energy saving alternatives and by being generally more energy efficient, shopping around between competitors. Where groceries are concerned, consumers are likely to implement cost savings mechanisms by trading down on food lines and

shopping more frequently but spending less to reduce waste. The most recent data from quarter two in 2012 shows that as the economy went back into recession, expenditure on 'food and non-alcoholic beverages' is the largest positive contribution to growth in volume terms. This would suggest that consumers feel confident spending more on food as a proportion of household expenditure during the harsh economic climate, thus reinforcing the notion from some commentators that the grocery market has benefited from consumers possibly eating out less and spending more in grocery stores (Bradbrook, 2008; Mitchell, 2009; Vaitilingam, 2009; Donald, 2013).

Given that the main focus of the research is concerned with the impact of the recession on the food retail market, further breakdown of the HHFCE data using chained volume measures for the 'food and non-alcoholic drink' and 'alcohol' COICOP classifications are provided in Figure 5.3(a) and Figure 5.3(b) respectively. On reflection, it is evident that consumer spending has not only altered between the main sectors of the COICOP but within the internal groupings also. In terms of food, between 2002 and 2011, meat has remained the most expensive part of a household food budget, followed by 'bread and cereals', 'vegetables', and 'milk, cheese and eggs'. In comparison, 'oils and fats', 'fish' and 'other food' make up the smallest part of household expenditure on food. Prior to the recession, the majority of the different food types witnessed an increase in the amount of expenditure as households spent more on food. Those which increased the most year-on-year were 'vegetables' and 'fish'. This is in keeping with the literature on healthy living as consumers have become increasingly more aware of what constitutes a healthy diet (Birkin *et al.*, 2002; Little *et al.*, 2009; Vaitilingam, 2009; Kohijoki, 2011), especially since the highly publicised campaigns by Jamie Oliver. During the recession which spanned across 2008 and 2009, households only increased expenditure on 'milk, cheese and eggs' (1.89 per cent). The rest of the food groups all declined, with 'meat' (-3.44 per cent) and fish (-8.77 per cent) reducing the most. Moving into 2010 as the economy recovered, households once more increased their expenditure on the majority of the different food types. Those worth mentioning include 'meat', 'fish' and 'vegetables', as consumers began to revert back to normal purchasing behaviour. Since 2010, the latest data for 2011 demonstrates expenditure on food has once more dropped as the UK has gone back into recession in 2012. Those groceries which households have opted to reduce their expenditure on the most have been the more expensive items 'meat' (-3.97 per cent) and 'fish' (-14.75 per cent). Expenditure on the more staple goods such as 'bread and cereals' and 'milk and eggs' has declined slightly, but overall has remained consistent between 2010 and 2011. The purchasing behaviour for these sorts of products often remains consistent during an economic downturn as they form a basic part of any household food basket.

The final part of HHFCE data to be analysed is the ‘drinks’ classification. It must be noted that under the standard COICOP classification, alcoholic and non-alcoholic drinks are recorded under different headings. However, in this instance Figure 5.3(b) brings them together so that food and drink can be analysed individually. Between 2002 and 2007, ‘fruit and vegetable juices and other soft drinks’ formed the largest amount of expenditure on drinks. However, this has been declining year-on-year and in 2007 ‘wines, cider and perry’ became the most dominant drinks product. In 2011, expenditure on ‘wines, cider and perry’ contributed £7,259 million to the economy followed by ‘fruit and vegetable juices and other soft drinks’ with £6,672 million. During the recession in 2008 and 2009, expenditure on drinks declined slightly apart from ‘coffee, tea and cocoa’ which did not decline until 2010. In general, households cut back the most on alcoholic drinks, in particular ‘beer’ and ‘spirits’. During the brief recovery of 2010, expenditure on alcoholic drinks recovered, whilst spend on ‘fruit and vegetable juices and other soft drinks’ and ‘coffee, tea and cocoa’ actually continued to decline. The latest figures for 2011 suggest a slight turnaround of this trend, as consumption on ‘fruit and vegetable juices and other soft drinks’ increased between 2010 and 2011 by 1.27 per cent. With regard to alcoholic drinks, ‘wines, cider and perry’ remained the most resistant to economic forces.

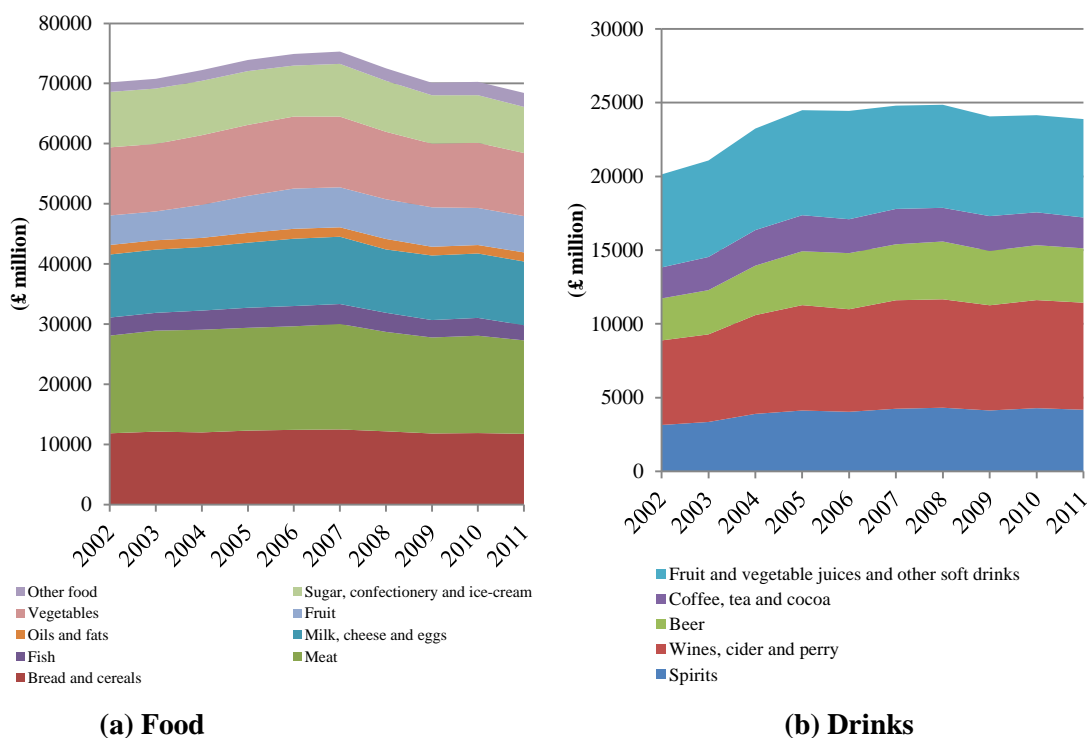


Figure 5.3. UK HHFCE at chained volume measures on ‘food and drink’ (2009 prices)
Source: ONS (2012a)

5.2.2 Business and Employment

Whilst the previous section looked at the national trends in consumer expenditure over the last ten years, this section will concentrate on the issues of business survival and employment within

the retail sector and more specifically the grocery market. Initially, Table 5.2 shows the total number of births (a business that was not present in the previous two years) and deaths (a business that was no longer present in the active file) in GB between 2004 and 2010. The data are taken from the new Business Demography series produced by the ONS which is discussed in more detail in Chapter 4. The data in Table 5.2 suggest that, between 2004 and 2008, the number of business births remained relatively flat. Arguably there has been some decline; however the rate of births remained above the rate of deaths which indicates an element of growth within the economy. Alternatively, the number of deaths declined between 2004 and 2008, suggesting the number of business surviving past their first year was also on the increase. Moving into 2008, the data shows a somewhat different picture. The harsh economic climate caused by the recession clearly had an impact on the survival of businesses, as for the first time the death rate overtook the birth rate in 2009. The death rate increased again in 2010 whilst the birth rate stabilised after falling in 2009.

Table 5.2. Business births and deaths between 2004 and 2010 in GB

		Active	Births		Deaths		
			Count	Rate (%)	Count	Rate (%)	
2004	2,106,730		274,350	13.0		239,705	11.4
2005	2,129,255		269,220	12.6		224,580	10.5
2006	2,151,845		249,950	11.6		203,350	9.5
2007	2,222,555		274,770	12.4		219,840	9.9
2008	2,265,740		261,790	11.6		218,380	9.6
2009	2,282,200		232,085	10.2		271,770	11.9
2010	2,241,375		230,555	10.3		292,005	13.0

Source: ONS (2012f)

Figure 5.4 details business death rates between 2008 and 2010 by the 2007 SIC broad groupings. Again, more details are given on the 2007 SIC in Chapter 4. Unfortunately, it was not possible to produce consistent data before 2008 due to the nature of the changes made to the 2003 SIC in 2007. Nevertheless, with the economic downturn not starting until 2008, the data at least allow for exploration of the last three years. Figure 5.4 shows that death rates differ substantially across the different sectors and thus from the national average. Those with particularly high rates in 2010 include ‘business administration & support services’ (22.6 per cent), ‘accommodation and food services’ (15.7 per cent) and ‘construction’ (13.84). The high rates associated with the ‘business administration and support services’ sector is likely due to the large closures of quasi-autonomous non-governmental organisations (quangos), a move by the Coalition Government to improve accountability and cut costs in 2010 (see Chapter 2). Furthermore, considering the documented impact of the sub-prime mortgage crash on the housing market, one would have also expected the number of ‘construction’ business closures to be high as well. The above average death rate for ‘accommodation and food services’ is also

consistent with the comments made in Section 5.2 that consumers cut back on eating out in restaurants in 2009 and 2010. Interestingly, a number of sectors actually recorded a decrease in the percentage of deaths between 2008 and 2010. For example, between 2009 and 2010, the death rate in the ‘retail’ sector declined. This would imply that after struggling initially during 2008 due to low consumer confidence, the retail sector began to recover. In addition, the ‘health’ and ‘information and communication’ sectors, after an initial increase in death rates, recorded a reduced rate in 2010. Remarkably, the ‘health’ sector reduced its birth rate to levels seen back in 2008.

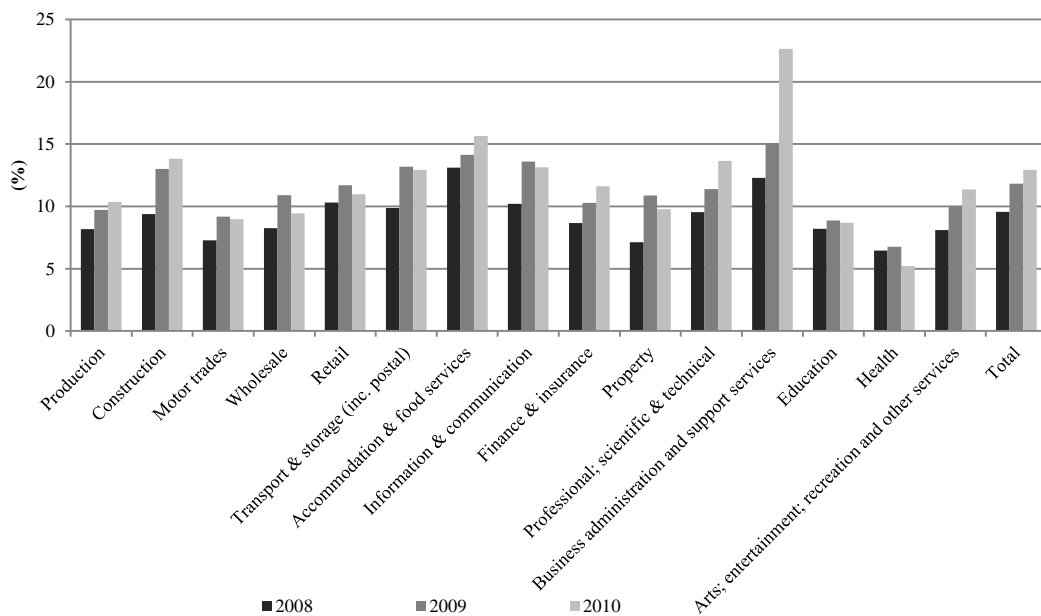


Figure 5.4. Business death rates by 2007 SIC broad classification from 2008 to 2010 in GB
Source: ONS (2012f)

So, to explore the impact of the recession on the retail industry in more detail, Figure 5.5 displays a breakdown of the 2007 SIC ‘retail’ group. The graph highlights the percentage change in births and deaths between 2008 and 2010. The average values for GB and ‘retail’ as a whole have also been included to provide benchmarks. First of all, when compared to the national economic trend for births and deaths, the retail sector shows a smaller increase in deaths and an increase between 2008 and 2010 in the number of births. This is encouraging as it demonstrates the retail sector overall has not suffered as much as some commentators initially predicted (Retail Technology Review, 2009a; Rueben, 2009; Hardie, 2009). In the context of the grocery market, ‘retail sale of food, beverages and tobacco in specialised stores’ represents the sale of groceries by independent retailers and ‘retail sale in non-specialised stores’ covers retailing in supermarkets. Looking specifically at ‘retail sale in non-specialised stores’, there has actually been a reduction in the number of deaths (-10.34 per cent) and an increase in the number of births (+8.92 per cent) between 2008 and 2010. In comparison, the smaller

independent retailers covered in the ‘retail sale of food, beverages and tobacco in specialised stores’ also recorded a reduction in the number of deaths, whilst the number of births remained flat at (0.37 per cent). This links strongly to the debate by Wrigley and Dolega. (2011), as the smaller more specialist retailers have been said to have struggled in the face of the difficult economic climate and increased competition from large supermarkets.

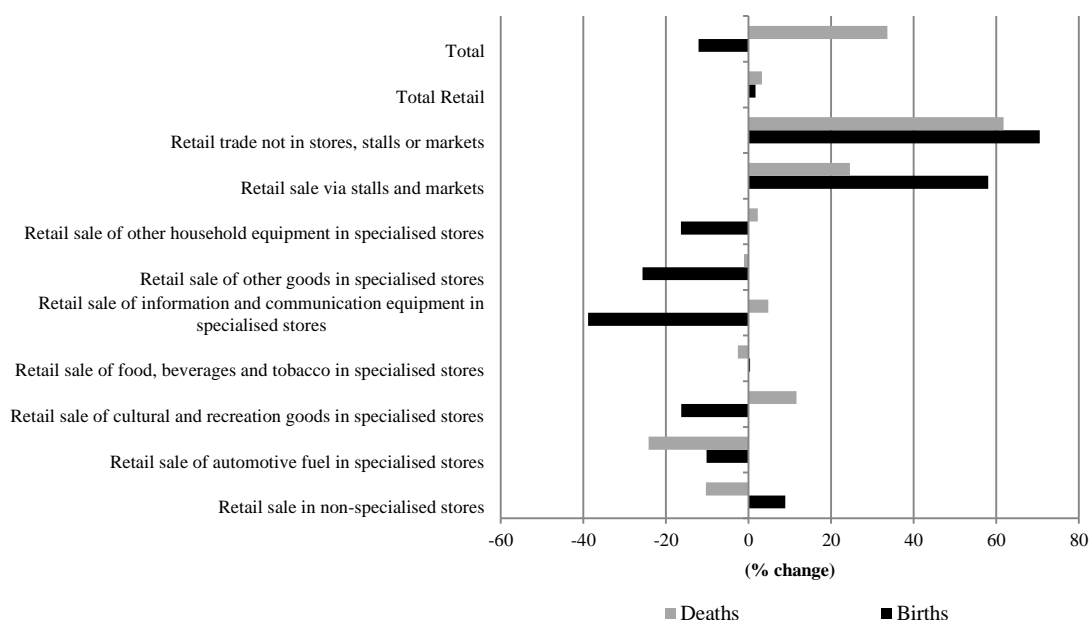


Figure 5.5 The percentage change in births and deaths from 2008 to 2010 by retail 2007 SIC in GB

Source: ONS (2012e)

The number of business closures and openings ultimately has a knock-on effect for the amount of people employed across the country. Therefore, Figure 5.6 displays the percentage change in employees between 2008 and 2010 for GB by the groupings which make up the retail 2007 SIC. The data come from the Business Register and Employment Survey (BRES) which provides annual employment and employee estimates for the UK. For a more detailed account of this dataset, the reader is directed to Chapter 4. Once again, the data also include the percentage change in total employees for GB and for the retail market as a whole for context. It is also worth noting that the BRES data allow for further breakdown of the ‘retail sale in non-specialised stores’ group to include ‘retail sale in non-specialised stores with food, beverages or tobacco predominating’. Figure 5.6 highlights the large-scale decline in the number of employees which occurred between 2008 and 2010 across the majority of retail groups. This is not surprising given unemployment reached 2.5 million in the UK in 2010 (ONS, 2010b). However, between 2008 and 2010, the number of people employed in ‘retail sale of automotive fuels in specialised stores’ and ‘retail sale in non-specialised stores with food, beverages or tobacco predominating’ actually increased by 15.13 per cent and 1.13 respectively. This highlights the strength and robustness of supermarket retailers during recession. Conversely, the

number of employees registered in ‘retail sale of food, beverages and tobacco in specialised stores’ reduced by -17.37 per cent. This is a considerable reduction when taking into account that the average decline in retailing as a whole was only -4.37 per cent. This would suggest that whilst the number of independent grocery businesses did not decline during this period (Figure 5.6), the number of employees were reduced substantially, arguably to make efficiency gains and to save the business in some cases.

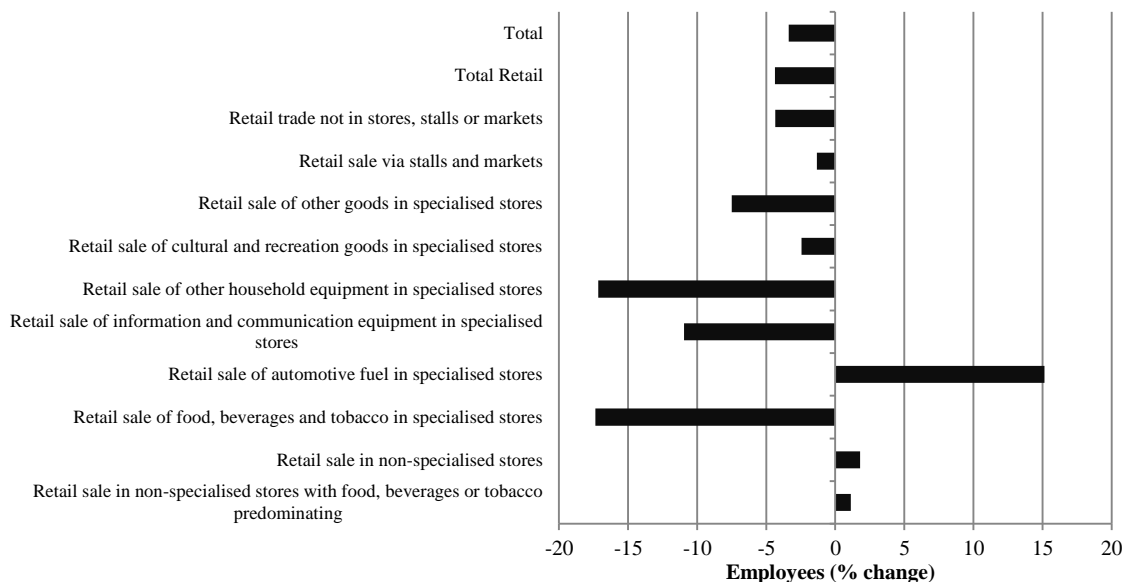


Figure 5.6. The percentage change in employees from 2008 - 2010 by retail 2007 SIC in GB

Source: BRES (2012e)

5.2.3 Grocery Market Concentration

In the final part of Section 5.2, analysis will be provided on the national performance of specific grocery retailers during the economic downturn. First of all, official quarterly market share data are shown in Figure 5.7 for the leading food retailers in GB from 2007 to present. Figure 5.7(a) represents the ‘big four’ retailers along with the Co-operative and the discounters (Aldi, Lidl and Netto), whereas Figure 5.7(b) highlights the performance of some of the second-tier retailers. It must be noted that the data are not seasonally adjusted, which explains some of the spikes in the final quarters of each year (Christmas period). Figure 5.7(a) indicates that Tesco still remains the top retailer with 30.70 per cent of the market in 2012 quarter 3, followed by Asda (17.32), Sainsbury’s (16.51), Morrisons (11.91), Cooperative (6.62) and the discounters (Aldi, Lidl and Netto) with 6.5 per cent. When compared to the figures in 1999 by Burt and Sparks (2003) in Chapter 3, it is clear that the level of concentration has increased in the market, as the ‘big four’ have all expanded their overall share of the market. The same can be said for the discounters and the Co-operative. The continuing growth by these retailers, especially the ‘big four’, contradicts many of the suggestions that market saturation would be reached during

the early part of the twenty-first century (Duke, 1998). Furthermore, it points out the clear failings of Competition Commission in limiting the trend to oligopoly, as Tesco for instance has continued to develop.

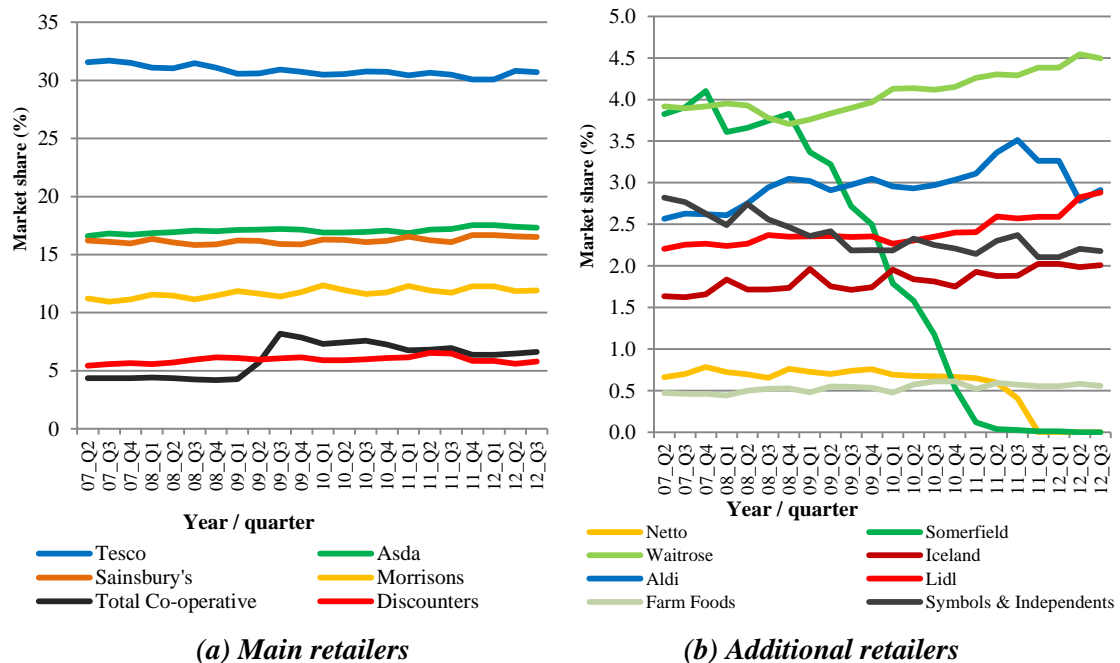


Figure 5.7. Quarterly market share figures for selected retailers in GB from 2007 to 2011
Source: Kantar Worldpanel (2007- 2012)

However, in comparison, a number of the retailers in the second tier (Figure 5.7(b)) have not fared as well. For example, since the Cooperative acquired Somerfield in 2008, the number of Somerfield stores has decreased steadily as they have been converted into the Coop format. Moreover, despite initial success in 2008 and 2009, Netto no longer exists since the sale of the company to Asda in 2010. Whilst the majority of Netto stores were quickly converted to an Asda fascia or sold to other retailers on instruction from the Competition Commission (CC), it was not until the last quarter of 2011 that trading stopped under the Netto fascia (hence the drop in discounters' market share in Figure 5.7(a)). Additionally, synonymous with the reduction in people employed by independent retailers in Figure 5.6, Figure 5.7(b) highlights the struggle of small independent retailers. This is by no means a new development caused solely by the recession, as this trend has been occurring for some time now (Coca-Stefaniak *et al.*, 2005; Wrigley *et al.*, 2009). This amplifies the failings of PPG6 as the protection of town centres and independent retailers was regarded as a priority in the guidance. It could be argued, however, that the recession has amplified this problem, placing small businesses in extreme financial difficulties, which has ultimately led to a decline in employment and, business foreclosures.

In terms of performance during the recession, the retailers have had varied success. Initially, in 2008, households reacted to the uncertainty associated with the harsh economic climate by switching to low-cost ranges and low-end retailers. However, despite the reduction in spending, food price inflation (Table 5.1) remained high which enabled the market to sustain growth. This meant Aldi and Lidl had huge success during 2007 and 2008, posting increases of 20.8 per cent and 11.1 per cent respectively in September 2008. Furthermore, as consumers began to re-evaluate the benefits of frozen foods, Iceland launched its '75p Freezer Essentials' campaign which has enabled the company to produce growth of 12.9 per cent since 2007. Haldanes, the mid-sized retailer also entered the market in 2009, opening around 20 stores across the UK. Of the 'big four', Asda and Morrisons became popular with consumers, often regarded as being more affordable, whereas Tesco and Sainsbury's recorded small dips in market share. At the top end of the market, Waitrose came under some pressure with growth slowing considerably, causing a reduction in the retailer's overall market share. Moving into 2009, the data in Figure 5.7 demonstrate the resilience of the grocery market. Despite consumers cutting back in other retail sectors, the market lifted by 6.4 per cent. At this point, the uncertainty and fear which helped drive the recession were beginning to fall away. As seen in Figures 5.1 and 5.2, food remained a manageable proportion of most household budgets, suggesting the grocery sector suffered from an over-reaction at the end of 2008. By September 2009, Waitrose became the top performing retailer with a growth rate of 11.2 per cent, the highest for the company since August 2006. Furthermore, the majority of the other retailers (Asda, Morrisons, Sainsbury's and the discounters) with exception of Tesco continued to grow. The major challenge at this point, however, was falling grocery inflation which was restricting the value of growth. This should not be confused with falling prices though, as prices were simply rising more slowly.

In 2010, consumers started to place growing importance again on fresh and quality foods, boosting sales at Morrisons, Sainsbury's and Waitrose but hitting Asda (Kantar Worldpanel, 2010). This can be seen in Figure 5.3(a) through the rise in amount spent on fruit and vegetables. Fortunes continued to be mixed among the retailers as market growth was around 4.3 per cent. Sainsbury's and Morrisons delivered another strong set of results, both lifting their market share and growing ahead of the market at 5.5 per cent and 5.9 per cent respectively. The market started to become heavily polarised as some consumers started to place increasing importance on both the freshness and quality of the food or cost. This enabled a remarkable turnaround of Sainsbury's fortunes and fuelled strong growth for Waitrose. The discounters also continued to grow, although at a somewhat slower rate than 2008. Moreover, even the independents maintained their footing in the market with a good performance, as those smaller operators which continued to survive adapted to the market changes. Additionally, with the Co-operative conversion of Somerfield stores nearly complete by the end of 2010, Somerfield all

but disappeared from the high street with just a 1 per cent share left in the market (Figure 5.5). After only two years in the market Haldanes also ceased trading in June 2011 after failing to find a buyer to take on its £8 million debt. By contrast, Tesco's performance remained largely unchanged, as it became pushed into middle ground. As inflation rose towards the end of 2010, shoppers started to manage their 'personal' inflation by trading down and seeking out lower priced goods once more (Kantar Worldpanel, 2011). Therefore, in 2011 it is of no surprise that the discounters continued to grow above the market average. Interestingly, consumers still sustained the tendency to purchase premium own-label goods, confirming that despite economic pressures, low price is not the only motivation in the food retail market (contrary to Howard and Sheth, 1969). This polarity is demonstrated by the continued success of Waitrose in 2011, as the company recorded growth of 8.3 per cent, over double the market growth. In addition, the Somerfield conversions continue to lift the Co-operative share, while Iceland benefited from its push into the convenience sector with aggressive long-term promotions on staple items such as milk. Unlike the other discounters, the performance of Netto was diminishing, undoubtedly due to the delay in reopening and staffing of new Asda stores.

As the economy fell back into recession during the start of 2012, the grocery market share figures for the big four were mixed. Morrisons and Tesco struggled, with Tesco's market share dropping below the 30 per cent mark for the first time in nearly seven years as it struggled to compete. Philip Clarke, the head of Tesco's international business (at the time) stated however that the poor performance was a result of 'longstanding business issues' (Financial Times, 2012) – it is believed that this was a reference to Tesco's international performance which shall be discussed in section 5.3.4. Conversely, the completion of the Netto conversion led to an all-time record performance for Asda, lifting its share to 17.5 per cent. Sainsbury's also saw its share grow to 16.7 per cent consolidating its strongest hold of the market since March 2003. Both companies have been pushing strong price messages since 2010 which has clearly served them well (Asda with its 'Price Guarantee' and Sainsbury's with its 'Brand Match'). Outside the big four, Iceland's 2.1 per cent share in 2012 was its highest share for ten years as shoppers continued to manage down their spending. This was no doubt one of the driving factors that explain chief executive Malcolm Walker and his management team leading a successful £1.55 billion buyout of the firm in March 2012 (BBC, 2012). Elsewhere, Aldi and Lidl continued their strong run as cash-strapped consumers responded to the tough economic conditions, increasing their shares to 3.5 per cent and 2.5 per cent respectively. However, the disappearance of Netto meant that the size of the total discount sector was relatively unchanged at 6 per cent. Another sign of austerity making an impact has been the decline of the premium own label sector. Premium own label products had been showing continuous growth since 2008, despite often being more expensive than their brand equivalents. By 2012 however, they were declining

by 6 per cent year-on-year, while economy own labels were growing at 13 per cent (Kantar Worldpanel, 2012). The other retailers have recognised this, for in an attempt to regain some of the market share, Tesco has launched its own discounter brands. However, this has hurt Tesco's margins, as it now has to sell more just to stand still (Rigby, 2009). This is arguably why demand for the retailer has increased since 2008/09; however it may be why its national market share has declined of late. Sainsbury's has also tried its own discount range but with limited success. In fact, the most successful and surprising has been the introduction of Waitrose sleekly packed 'Essentials' range (CACI, 2011). The difference being with this discounted range is that nothing in the 'Essentials' packaging marks it out as a value range. After finding itself being pushed into middle ground of what is a polarised market, Tesco dropped its iconic discount lines (blue, red and white stripes), a sign that it could be positioning itself towards the middle-higher end of the market as the economy begins to show signs of recovery.

5.3 Retail Demand and Consumer Behaviour

So far, the analysis in this chapter has been restricted to the national level. Therefore, the following section aims to provide a more geographical analysis of changing retail demand and consumer behaviour in the British grocery market. Attempts will be made to evaluate the overall state of the British grocery market, in terms of remaining growth opportunities for, and levels of market dominance by, individual retailers. The analysis of opportunity will be provided through an examination of whether local monopolies exist at a sub-regional level and which of the leading grocery retailers may be benefitting from them. This will form a major contribution to the literature on grocery retailing as little research has been done since the major studies by Langston *et al.* (1997) and Poole *et al.* (2002) on the geography of retail demand within the grocery market. Once more, specific attention will also be given to the impact of the recession, if any, on the performance of the main food retailers across GB.

5.3.1 Grocery Expenditure Variations between Local Authority Districts

Grocery expenditure in terms of its contribution to the national economy has already been discussed in some detail. Therefore, the following analysis will concentrate more on the geographical patterns of household grocery expenditure in GB. First of all, Figure 5.8 displays the percentage of households in each LAD that spend £50 or more on groceries per week for 2011. Grocery expenditure relative to the number of households provides a useful indicator for potential expansion for retailers and has previously been used by Langston *et al.* (1997) and

Poole *et al.* (2002). In this case, the data are presented as an index so that that each value is compared to the national average for GB. The index was calculated as followed:

$$I_i = \frac{P_i}{P_*} \times 100 \quad (5.1)$$

where, I_i represents the index value for each LAD i , P_i is the percentage of households in each LAD i that spend £50 or more on groceries per week, and P_* is the percentage of households that spend £50 or more on groceries per week for all of GB (average). The data are taken from Acxiom's Aggregate Data (AD) which is discussed and evaluated in some detail in Chapter 4. It would have been preferable to use average expenditure for each LAD, but the data from the ROP are collected in categorical format which makes calculation of averages difficult. Nonetheless, the data represent a unique opportunity to analyse local spatial patterns within the grocery market.

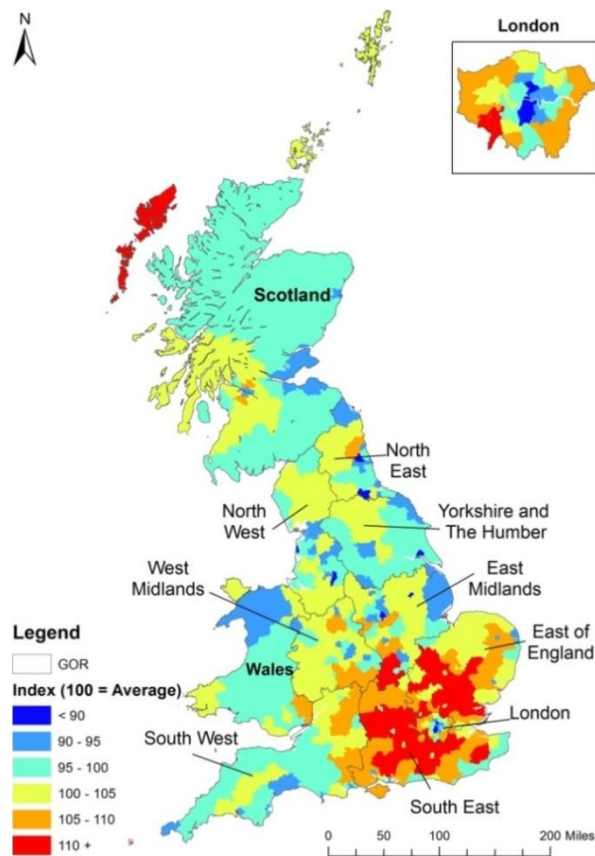


Figure 5.8. An index of the percentage of households that spend £50 or more on groceries per week by LAD in GB, 2011
Source: Acxiom Ltd (2011)

Figure 5.8 suggests that grocery expenditure has a definite spatial pattern across GB. The highest levels of weekly expenditure are concentrated in the South East (e.g. Sevenoaks, Tandridge and South Bucks) and parts of London (north and west) in particular. In comparison,

Wales, Scotland (Aberdeen) and large parts of northern England (Hull, Blackpool, Salford and Scarborough) have much lower levels of expenditure over £50 per week. This is consistent with the work of Poole (2002). However, given that Poole (2002) applied a national average to the proportion of socioeconomic groups in each postal area, it is believed that the data in Figure 5.8 provide a more accurate assessment of the geography of grocery expenditure in Britain. Even within selected GORs, the level of expenditure can be quite different between LADs. For example, within Yorkshire and the Humber, the more affluent county of North Yorkshire displays above average levels of expenditure compared to the less affluent districts of West Yorkshire, South Yorkshire and the East Riding. This relationship between affluence and expenditure will be discussed in more detail in Chapter 6. In London, expenditure is much lower in the inner-city areas and city centre, compared to the north and outer London. Once again this raises the issue of affluence on expenditure. However, given the complex nature of the grocery market in London (Thompson *et al.*, 2012), there are also convenience (smaller outlets), ethnicity (different purchase and consumption behaviours) and demographic (high population density) factors to consider (explored in Chapter 6).

It has already been established in Section 5.2.1 that rising inflation on grocery expenditure has rapidly increased the cost of food during the recession, however due to the categorical nature of the Axiom AD data, it is difficult to take this into account. Therefore, any patterns identified in Table 5.3 must be made in the knowledge that inflation has not been considered. Table 5.3 shows the percentage of households by Vickers *et al.* (2003) LAD classification that spend £50 or more on groceries each week. Figures are shown from 2005 to 2011 so that considerations can be given both before and after the recession started. £50 was also chosen as the break point because research from the ONS stated average grocery expenditure on ‘food and non-alcoholic drink’ was around £53 in 2011 (see Chapter 6). Table 5.3 has also been coloured to show low values in blue and high values in red.

Table 5.3. The percentage of households that spend £50 or more on groceries per week by LAD area classification in GB, 2005 to 2011

Vickers LAD Class	Households (%)							% points
	2005	2006	2007	2008	2009	2010	2011	2007-2011
Industrial Legacy	48.16	50.03	52.92	57.74	62.06	65.39	67.48	14.56
Struggling Urban Manufacturing	45.50	47.12	49.33	54.24	58.91	62.56	64.84	15.51
Regional Centres	42.47	43.58	45.18	50.56	55.90	59.99	62.65	17.47
Multicultural England	46.79	48.23	50.33	55.18	59.82	63.48	65.59	15.26
M8 Corridor	45.39	47.40	50.25	56.09	61.49	66.00	68.25	18.00
Redeveloping Urban Centres	46.03	47.34	49.82	54.59	59.40	62.77	65.03	15.21
Young Multicultural	46.42	47.26	48.38	53.55	58.56	62.38	65.12	16.75
Rural Extremes	48.54	50.41	53.28	58.53	62.96	66.67	68.39	15.11
Agricultural Fringe	52.35	53.91	56.60	61.36	65.64	68.95	70.50	13.90
Rural Fringe	54.75	56.21	58.94	63.53	67.60	70.62	72.20	13.27
Coastal Resorts	46.16	47.03	48.87	54.01	59.23	62.78	65.60	16.73
Aged Coastal Extremities	48.19	49.74	52.55	57.72	62.45	65.82	67.55	15.00
Aged Coastal Resorts	47.07	48.59	51.38	56.59	61.38	64.98	67.23	15.85
Mixed Urban	52.42	53.98	56.51	60.98	65.14	68.27	70.22	13.71
Typical Towns	51.87	53.16	55.66	60.12	64.47	67.63	69.68	14.02
Isles of Scilly	44.59	46.24	47.55	58.89	68.28	77.23	77.92	30.38
Historic Cities	53.05	54.20	56.57	61.24	65.81	69.01	70.88	14.32
Thriving Outer London	55.77	56.66	58.71	63.02	67.49	70.36	73.14	14.44
The Commuter Belt	59.50	60.60	62.98	67.32	71.50	74.39	76.33	13.34
Multicultural Outer London	53.89	54.46	56.04	60.29	65.17	68.51	70.92	14.87
Central London	46.69	47.75	49.69	54.80	60.16	63.93	67.02	17.33
City of London	40.95	40.96	42.91	51.13	60.86	68.21	64.85	21.93
Afro-Caribbean Ethnic Borough	44.87	45.42	46.75	51.44	56.43	59.73	62.33	15.59
Multicultural Inner London	46.70	47.11	48.58	53.01	58.88	62.49	66.28	17.70
Total	50.40	51.76	54.14	58.90	63.46	66.82	68.95	14.81

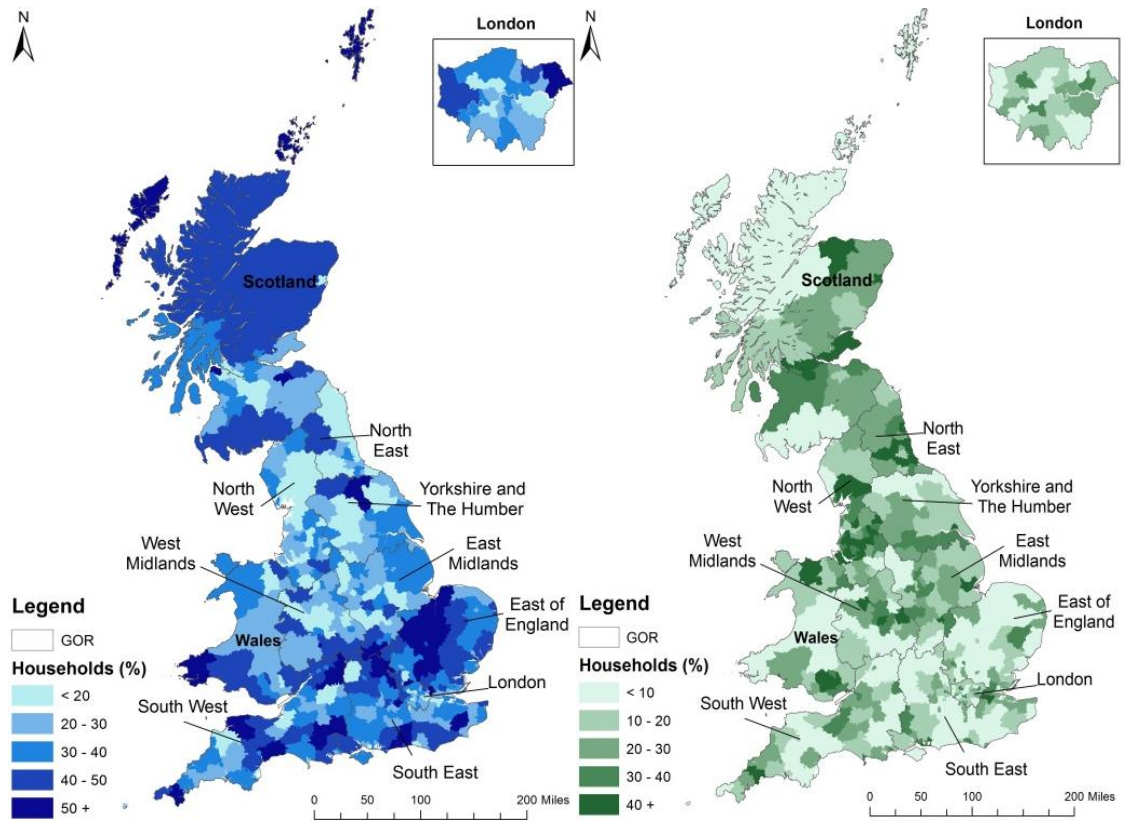
Sources: Vickers et al. (2003); Axiom Ltd (2005 to 2011)

As expected, given the rising inflation on food since 2005 (Table 5.1), the percentage of households spending more than £50 per week has risen each year. Nevertheless, when examining the figures across the different classifications, it is apparent that the increases witnessed at the national level are not the same across the country. For example, up until 2007, the difference between the maximum and minimum values was actually increasing. When considering that the lower values are associated with the more deprived areas such as ‘regional centres’ and struggling urban manufacturing’, the polarisation supports comments that during times of economic prosperity the rich get richer and the poor get poorer (Dorling, 2012). On the back of the financial crisis in 2007, this polarisation (max - min) between the different classifications reduces and then again between 2008 and 2009. This convergence of the data between 2008 and 2009 covers the period of recession in GB, a time when households were trading down to low-cost food lines and reducing their overall expenditure. In 2010, when the

economy began to recover, the figures in Table 5.3 become polarised once more. Based on the data from Figure 5.7, we know this to be a time when premium food lines and shopping at high-end retailers were becoming increasingly popular. Finally, in 2011 we see a pattern similar to that which occurred between 2007 and 2009. This is not surprising considering the level of economic uncertainty in 2011 brought about by the on-going Euro crisis, the London riots and threat of a double-dip recession (see Chapter 2). As a double-dip recession did occur in 2012, it is likely that more recent data would show a continuation of this trend. Nevertheless, to date, Table 5.3 exemplifies the areas spending the most on groceries per week to be those households living in ‘Isles of Scilly’, ‘the commuter belt’, and ‘thriving outer London, all of which are in the top level category termed ‘prosperous Britain’. Remarkably, the Isles of Scilly has moved from one of the lowest ranked areas in 2005, to the highest in 2011 – although this is arguably the result of a small numbers problem from the ROP data.

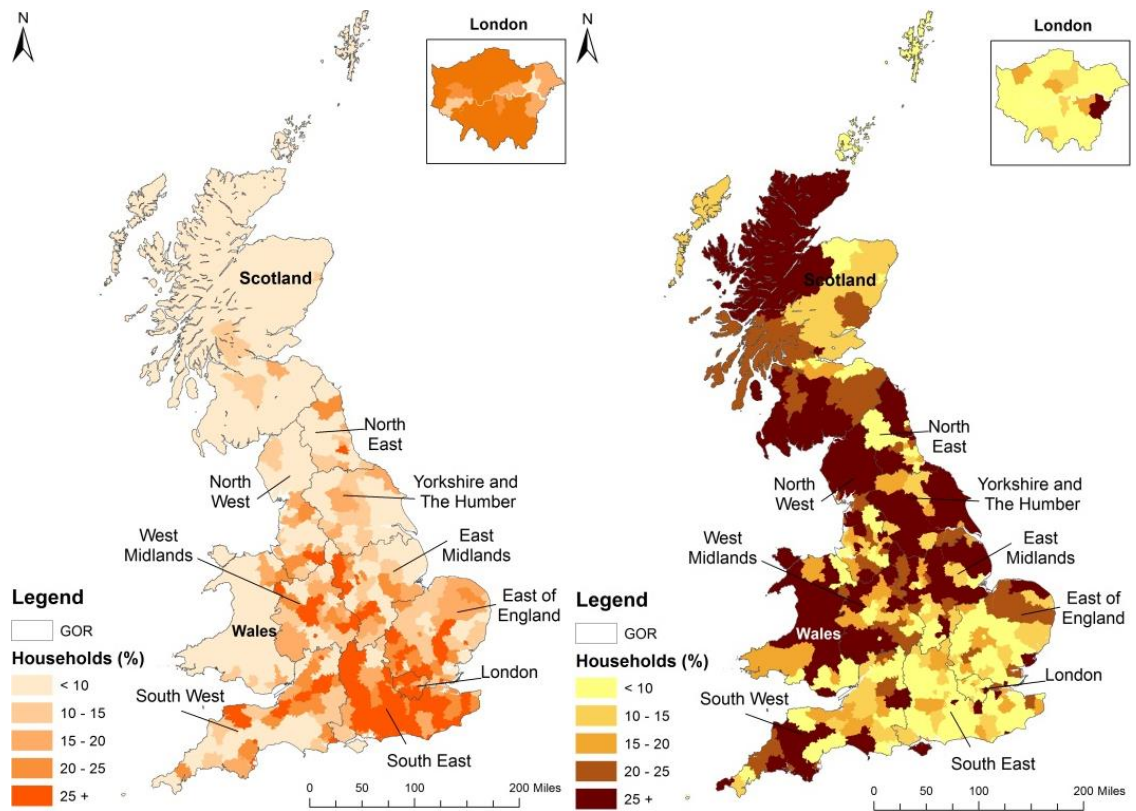
5.3.2 Spatial Variations in Grocery Market Share

It is also important to try and understand the geographical nature of consumer demand for the retailers within the British grocery market. In doing so, it will be possible to identify regional and sub-regional spatial monopolies for individual retailers. Furthermore, since it has already been established in Section 5.2.3 that considerable ‘switching’ behaviour has occurred since 2007, it would be beneficial to identify where this behaviour has been most noticeable. More specifically, whilst Burt *et al.* (2010) and Elms *et al.* (2010) provide a useful analysis on the progress of retailers at a national level, little is written in the academic literature regarding their performance at a sub-regional level. Hughes *et al.* (2009) were the last to attempt to provide such an insight. However, even in this case, store floorspace values from 2008 had to be used as a proxy for market share and only the top four retailers were evaluated. Consequently, Figure 5.9 displays the percentage of households by LAD that shop at each of the ‘big four’ retailers in 2011 – using Acxiom’s AD data.



(a) Tesco

(b) Asda



(c) Sainsbury's

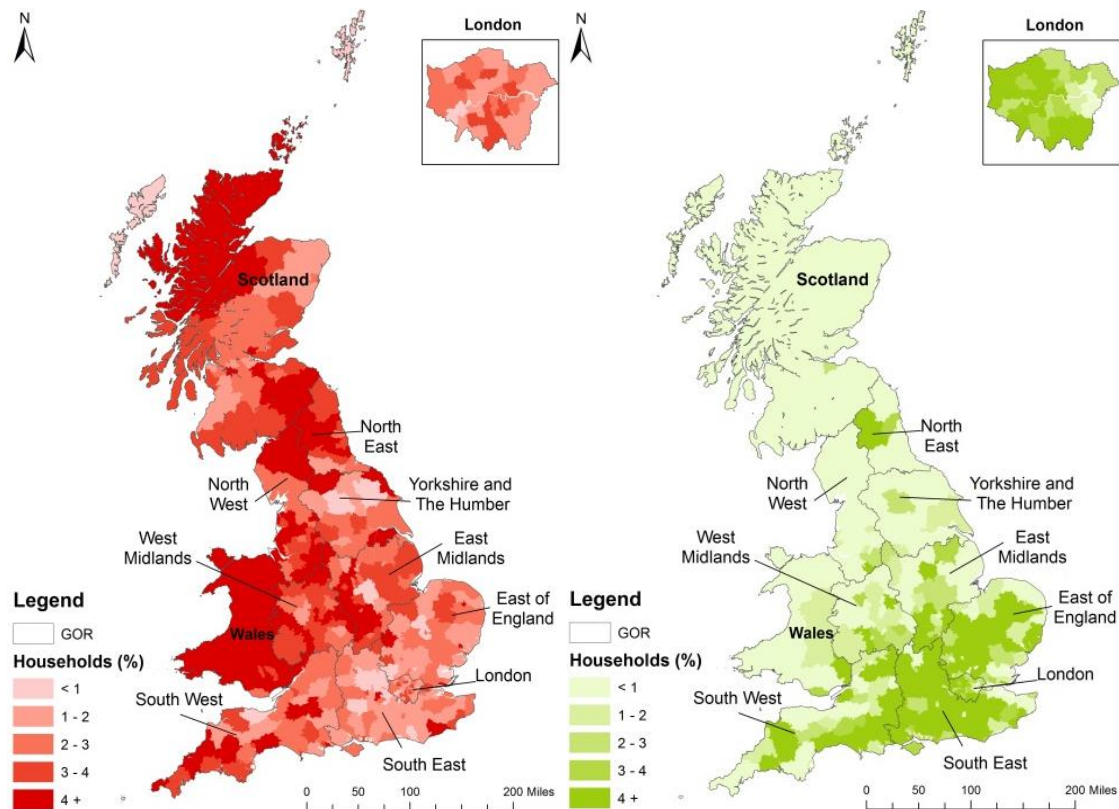
(d) Morrisons

Figure 5.9. Consumer demand for the 'big four' retailers by LAD in GB, 2011

Source: Acxiom Ltd (2011)

First of all, let us consider the current level of demand for Tesco, the grocery market leader in GB. Since starting out primarily in the South East, Tesco now has a relatively high market share throughout GB, controlling at least 20 per cent of household demand in most LADs. Tesco's share of the market is particularly high in south east England, South Wales, and northern Scotland, where it reaches over 40 per cent of the households. This dominance by Tesco has led to the term 'Tesco-Towns', a term used to describe those communities where Tesco dominates the local grocery market. An often cited example is Inverness, where Tesco owns three of the city's four supermarkets and allegedly takes 50-60 pence out of every pound spent on food (Martin, 2006). In comparison, Asda, Morrisons and Sainsbury's have a much more concentrated spatial pattern. For example, Asda dominates in Yorkshire and the Humber, the region where the company originally started. It also maintains high levels of demand in the North East, North West, Scotland and South Wales. In contrast the South East, the East of England and London represent areas where Asda still struggles to achieve a high market share, relative to the rest of the country. Morrisons has a similar market share pattern to Asda, as they too uphold relatively high shares of the market in northern England, Wales and parts of Scotland where, in many LADs, over 25 per cent of households shop with them. Once again, Morrisons, a northern based retailer, is strong in northern England and Wales. There is also high demand in the South West – arguably a result of the Safeway take over and the new large distribution depot in Somerset. Alternatively, Sainsbury's has a relatively high share of the market in southern England, particularly in parts of the South East and London where it controls over 25 per cent of household demand.

Outside of the 'big four', Figure 5.10 represents the local market share data for Waitrose and the collective discounters (Aldi, Lidl and Netto). Netto has been included for its continued trading until September 2011. Thompson *et al.* (2010a; 2012) provide a review of the discount grocery market, commenting on the success of this sector since arriving in GB in the 1990s. Figure 5.10(a) clearly shows that the discounters have a much smaller market share than the 'big four'; however, there is still an element of spatial concentration across the country. For instance, similar to Asda and Morrisons, the discounters appear to be most successful in northern England, Wales and Scotland. Moreover, London is an area where they too struggle to generate high levels of market share. However, it has also been identified by Aldi as a key part of its store expansion programme, described even as a 'gold mine' by Graham Hetherington, the company's director for London and the South East (Mail Online, 2008). In comparison, much like Sainsbury's, Waitrose is far more popular in London and the South East. Figure 5.10(b) portrays a highly focused spatial pattern in these two regions and interestingly also along the south coast. Additionally, there are also a few pockets of relatively high demand in some of the more affluent parts of northern England (Harrogate, Cheshire and Tyndale).



(a) Discounters (Aldi, Lidl and Netto)

(b) Waitrose

Figure 5.10. Consumer demand for retailers by LAD in GB, 2011

Source: Acxiom Ltd (2011)

In addition to the current pattern of retail demand, one of the primary objectives of the thesis is to understand the geographic impact of the economic downturn on the consumers and retailers. From section 5.2.3, the two most noticeable changes were consumers moving to shop at discounters and trading up to premium lines offered by Waitrose. Therefore, Figure 5.11(a) and (b) display the change in the percentage of households shopping at the discounters and Waitrose respectively. The change is represented in percentage points and not percentage increase to control for population growth (e.g. 10 per cent – 5 per cent = increase of 5 percentage points) First of all, Figure 5.11(a) indicates that between 2007 and 2011, when the discounters reached their highest ever market share; almost all LADs recorded an increase in demand for the discounters. The most noticeable levels of growth appear to be in northern England (in particular South Yorkshire) and the Midlands, areas where the discounters are currently competing strongly. Conversely, a couple of areas actually demonstrate a decline in discounter take-up including, for example, the affluent town of Harrogate. This is understandable considering the growth in consumer patronage for Waitrose in Harrogate displayed in Figure 5.10(b). Further examination of Waitrose’s growth between 2007 and 2011, shows that unlike the all-round growth from the discounters, consumer demand for the retailer has primarily

increased around the South East and East of England. Moreover, there are many more areas of decline, especially along the North East coast, southern Scotland and Wales. Given that Waitrose is struggling in these areas anyway (Figure 5.11(b)), it could suggest consumers are reverting back to popular local brands (increased brand loyalty). Nevertheless, something which is not considered is the actual store networks for the selected retailers, as it may go some way to explain the variations in growth for some areas (explored in Section 5.4).

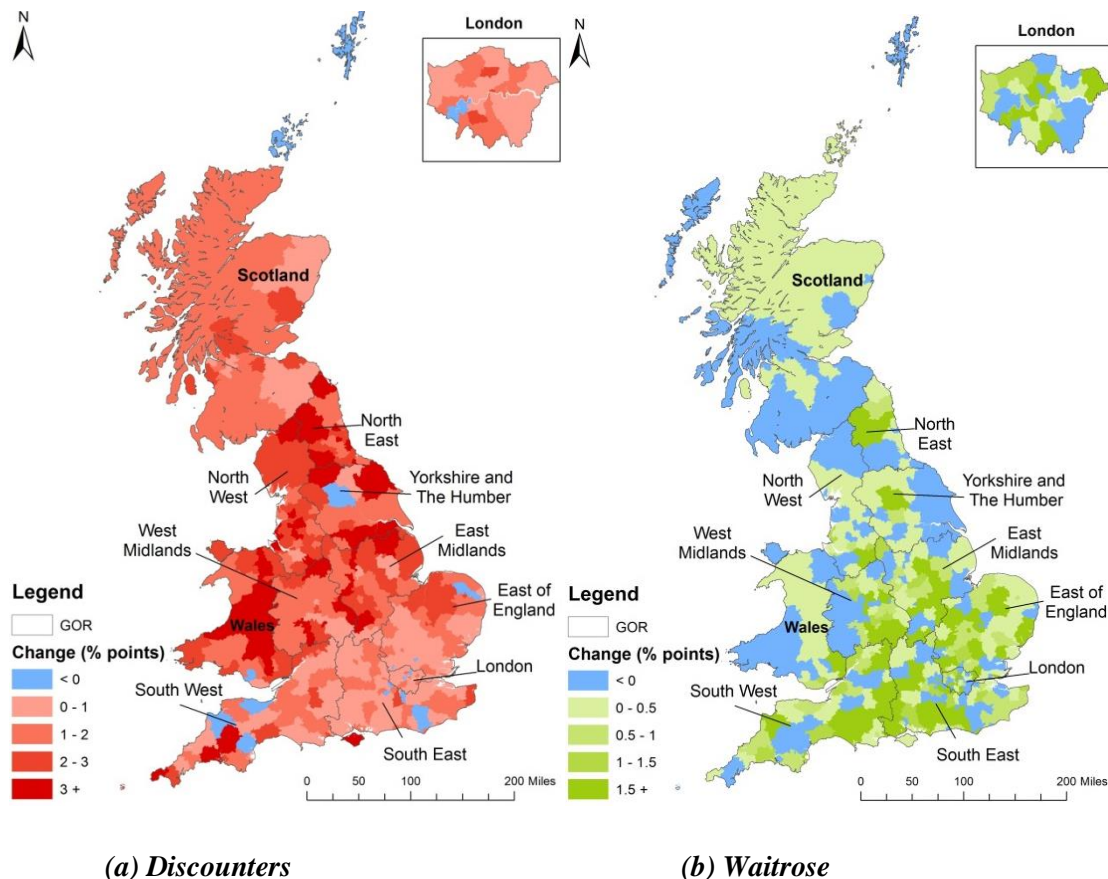


Figure 5.11. Change in consumer demand by percentage points, GB, 2007-2011.

Source: Acxiom Ltd (2011)

5.3.3 The Geography of E-commerce

The final dimension that will be considered with regards to consumer demand is that of online retailing or e-commerce as it is often known. As noted in Chapter 3, increased e-commerce activity is argued by some to bring about the ‘death of distance’ (Cairncross, 1997). The opinion is that shoppers no longer need to travel to physical stores, thus reducing the need for urban agglomeration and allowing rural consumers to enjoy all the benefits of access via the internet. De Blasio (2008) provides a useful summary of these arguments, many of parts of which may be true today – certainly there is a persuasive case that e-commerce has contributed to the

problems seen in many high streets around the western world along with many years of large-scale, out-of-town retail developments (Portas, 2011). However, other researchers assert that the high street is not necessarily in decline in all locations (Wrigley *et al.*, 2009, Wrigley and Dolega 2011). Instead, the focus should be placed on understanding the adaptive capacity and resilience that has enabled some British town centres/high streets to perform both relatively better in the face of greater traffic using e-commerce and greater competition from out-of-town developments (Wrigley and Dolega, 2011). Consequently, in an attempt up-date the literature on the spatial variations in e-commerce activities - what follows is an exploration of the geography of e-commerce, especially as seen in grocery retailing.

Figure 5.12 shows the average weekly value of internet retail sales for each month in GB between 2008 and 2012. It is clear from the graph that internet sales in the retail sector are growing and internet sales are becoming more important to overall retail growth. Alongside this general trend of escalating sales over time, punctuated with regular seasonal jumps at Christmas time, it is useful to consider the notion that e-commerce might be more important during a recession. For example, shopping online is all about saving time, reducing stress, saving money, exercising control and avoiding impulse buys. Additionally, Reynolds (2011) suggests the lower transaction costs that e-business firms are often more easily able to generate may appeal more to customers that are more price-sensitive, additionally arguing that UK online retailers generally did well in 2009 during the recession.

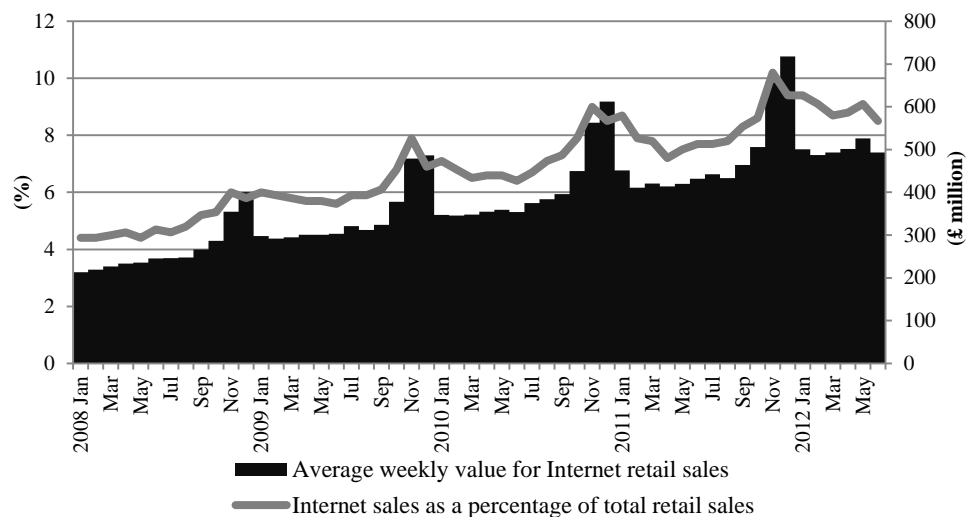


Figure 5.12. Average weekly Internet retail sales per month between 2008 and 2012 in GB
Source: ONS (2012h)

Whilst Figure 5.12 provides useful information on the overall level of online sales in the retail market, in some sectors the proportion of internet sales are much higher as certain products have a greater likelihood of success than others. According to Stern (1999), low rates of growth in online purchasing are expected in markets such as food and drink, rising to moderate levels of

uptake in clothes and electrical goods. The highest rates of penetration are expected in books, music and films. Later, Weltevreden (2007) adds credibility to these suggestions by reporting a 66 per cent online share for books and 62 per cent for CDs, DVDs and videos, falling to 5 per cent for shoes and 3 per cent for outer clothing. Similar evidence from Acxiom's ROP data is shown in Figure 5.13 for the British market. On the basis of this evidence, it seems that e-retail activity levels are also high for books, CDs and DVDs. The purchase of books in particular has grown substantially between 2010 and 2011; arguably a result of the introduction of e-reading products such as the Apple's I-pad and Amazon's Kindle. Although grocery sales are lower, expansion is still strong between 2010 and 2011, and, of course, there is a very large market by both volume and value. Only in the case of wine does it seem that online retailers are struggling to keep pace with the accelerating range and quality of supermarket distribution.

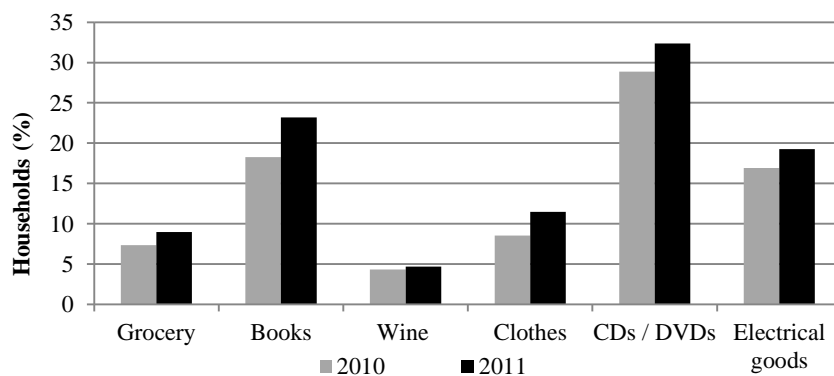


Figure 5.13. Percentage of households that use the internet to buy each product between 2010 and 2011 in GB.

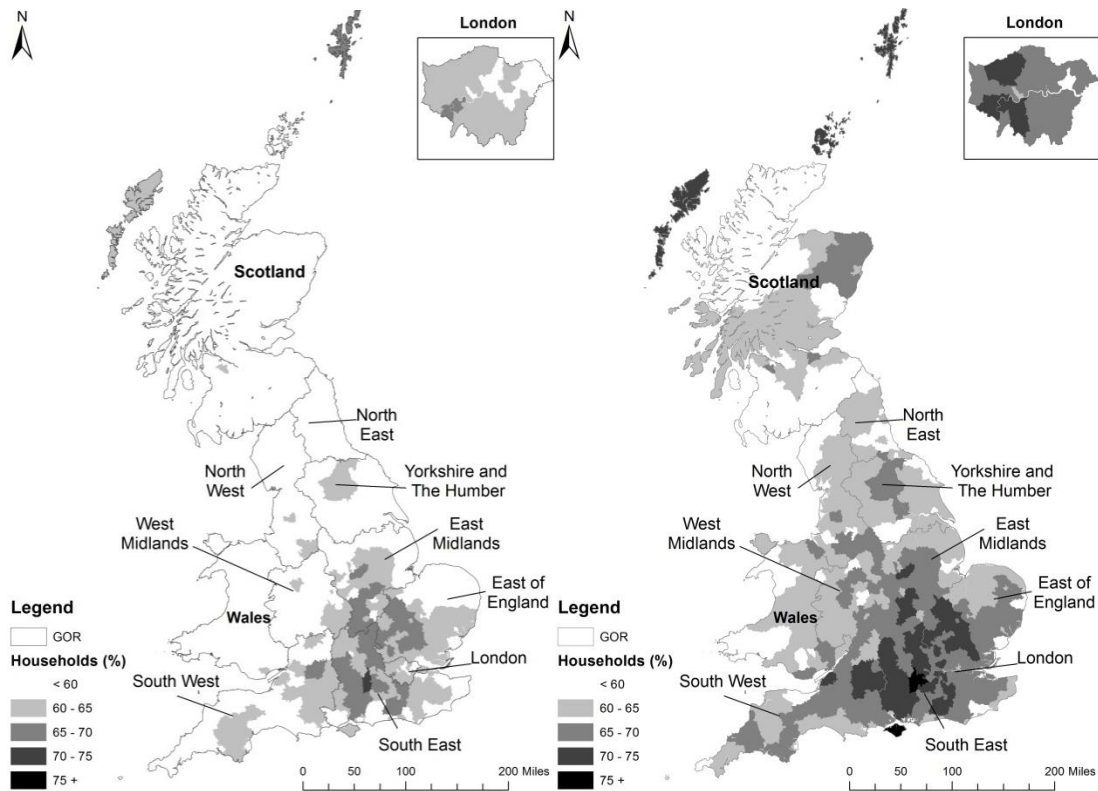
Source: Acxiom Ltd (2010, 2011)

In response to the comments that e-commerce will be the 'death of distance', a number of studies have highlighted differences in activity rates by demographic group (e.g. Weltreveden 2007), arguing that e-commerce users are more likely to be young, affluent and from professional backgrounds. This clearly has implications for the geography of e-purchases. For instance, demand will be greater in parts of towns and cities which are more affluent and contain a higher proportion of young professionals. Furthermore, other research suggests that there are interesting rural/urban differences in usage: in short, geography seems to matter for e-shopping (Farag *et al.*, 2006; De Blasio, 2008). In relation to the rural/urban question, it is often argued that e-commerce is a predominantly urban phenomenon, because new technology usually starts in centres of innovation and diffuses outwards (innovation- diffusion hypothesis; see Farag *et al.*, 2006). Reynolds (2011) quotes the Commission of European Communities data on broadband penetration rates across Europe, noting a rate of 25 per cent in the UK. These high consumer usage rates of broadband have enabled the UK to become a leading centre for online sales in general, and for online sales of grocery products in particular (compared to rates

outside the UK). However, there is little or no research depicting internet connection penetration for smaller geographical areas. Thus first, it is useful to explore the growth of internet connections across GB using Acxiom's ROP data.

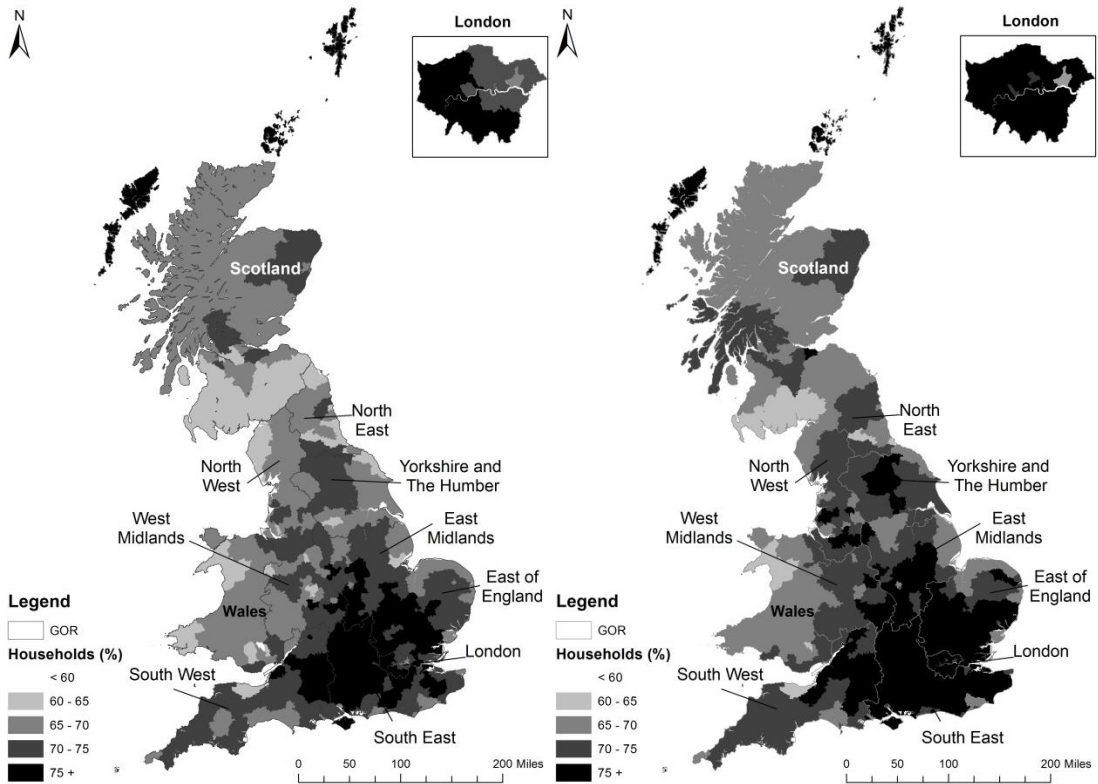
Figure 5.14 shows very rapid and clear trend of internet connection rollout in GB. Overall connection rates start at only around 58 per cent in 2008, with a marked concentration of internet access in London, the South East and rural parts of North Yorkshire (possibly a demographic/socioeconomic cause which shall be explored in Chapter 6). In the next three years, availability accelerates quickly to a situation in which the vast majority of areas provide internet access to more than 74 per cent of households in 2011. Although there still remains a pattern of greatest concentration in London and the South East, the trend would support Hagerstrand's Innovation-Diffusion hypothesis (Casetti, 1969). It is clear that the technology has spread out from London (core urban region) to the rest of GB. In 2011, only the most extremely rural areas of Wales and the Southern Uplands of Scotland look to be relatively underprovided. Interestingly, Figure 5.14 displays high concentrations in both extremely rural and urban areas. This clear spatial variation also goes some way to counter those arguments that e-commerce spells the death of distance.

Whilst Figure 5.14 provides an important insight to the supply of internet connections, it is also crucial to understand the actual take-up of the technology as a channel for purchasing goods. Consequently, Table 5.4 displays variations in the percentage of households that use the internet to buy groceries 'often' between 2008 and 2011 by the LAD area classification developed by Vickers *et al.* (2003). To provide context, internet connection rates are also displayed. An immediate and obvious conclusion from these data is that rates of use have increased year-on-year. This is consistent with Ellis-Chadwick *et al.* (2007) evidence that the online grocery market is growing in GB. Moving forward, the sector is expected to double in size over the next five years, with total sales forecast to reach £9.9 billion in 2015, growing at a Compound Annual Growth Rate (CAGR) of 15.3 per cent (IGD, 2012). If these estimates are fulfilled, online sales will equate to a 5.4 per cent share (a larger market share than the discounters) of the British grocery retail market – making online the fastest growing channel in British grocery retailing. During a time when the economy is struggling, the strong growth predicted for the online grocery channel presents an opportunity for companies of all sizes and types to meet the needs of today's multi-channel shopper and engage with consumers in different ways.



(a) 2008

(b) 2009



(c) 2010

(d) 2011

Figure 5.14. Percentage of households with an internet connection in GB, 2008 - 2011
Source: ROP (2008 to 2010)

Table 5.4. Percentage of households that use the internet often to buy groceries by LAD area classification in GB, 2008 - 2011

Class	Name	Buy groceries 'often' online (%)				Internet connection (%)
		2008	2009	2010	2011	2011
A1a	Industrial Legacy	3.37	4.34	5.54	6.13	69.22
A2a	Struggling Urban Manufacturing	3.32	4.37	5.64	6.39	66.76
A2b	Regional Centres	3.57	4.72	6.11	6.89	69.68
A2c	Multicultural England	3.49	4.39	5.50	6.09	70.94
A2d	M8 Corridor	3.13	4.12	5.28	5.83	69.43
A3a	Redeveloping Urban Centres	4.04	5.06	6.52	7.15	72.63
A3b	Young Multicultural	4.52	5.74	7.24	7.91	75.60
B1a	Rural Extremes	3.69	4.82	6.32	6.94	70.16
B1b	Agricultural Fringe	4.35	5.38	6.99	7.52	73.37
B1c	Rural Fringe	4.76	5.74	7.31	7.79	76.25
B2a	Coastal Resorts	4.45	5.52	6.91	7.47	72.86
B2b	Aged Coastal Extremities	3.69	4.61	6.06	6.64	70.68
B2c	Aged Coastal Resorts	4.15	5.14	6.70	7.18	69.51
B3a	Mixed Urban	4.01	4.98	6.28	6.86	73.68
B3b	Typical Towns	4.50	5.69	7.24	7.91	76.08
B4a	Isles of Scilly	2.66	3.01	3.87	4.34	77.88
C1a	Historic Cities	4.65	5.83	7.44	7.99	76.94
C1b	Thriving Outer London	5.89	6.96	8.58	9.04	80.71
C2a	The Commuter Belt	5.75	6.82	8.60	9.06	80.34
D1a	Multicultural Outer London	4.72	5.66	7.16	7.63	78.95
D2a	Central London	6.89	7.90	10.06	10.58	78.94
D2b	City of London	4.02	6.24	9.37	10.78	81.07
D3a	Afro-Caribbean Ethnic Borough	5.42	6.56	8.29	9.04	77.28
D3b	Multicultural Inner London	5.41	6.17	7.53	7.66	79.25
Total	Total	4.33	5.35	6.82	7.39	73.87

Source: Vickers *et al.* (2003); Acxiom Ltd (2008 -2011)

It is evident that the market for online grocery sales is as spatially differentiated as traditional store sales patterns. Rates are higher around 'central London' and the 'city of London' – as a likely result of the high concentration of internet connections in Figure 5.14. This supports comments made by Zook (2002) on how certain key urban centres have emerged as fundamental hubs for e-commerce, again helping to disprove the theory that e-commerce would be spatially neutral. The importance of the urban connection in centres of innovation such as London is crucial for Business to Business (B2B) e-commerce activities. In addition, rates are also high in spatially marginal areas termed the 'rural fringe', 'agricultural fringe' and 'the commuter zone'. Certainly, there is evidence outside of GB that as internet technology spreads to rural areas there is a greater awareness and belief that this form of retailing can be more relevant to rural consumers (Lennon *et al.*, 2007). Another consideration here is that place of residence could be becoming less important as a determinant of internet access. Thus, it could be that many users are actually accessing services from the workplace, and increasingly from mobile devices which could ultimately neutralise provision local to consumers to a considerable extent. Table 5.5 also highlights a pattern of much lower rates in some of the more deprived

areas termed 'struggling urban manufacturing', 'mixed urban', 'industrial legacy' and 'aged coastal extremities'. These variations highlight the demographic and socioeconomic elements which also plays an important role in the take-up of e-commerce usage (Weltreveden, 2007). These two issues will both be examined in further detail in Chapter 6.

In terms of e-commerce as an actual retail strategy in the British grocery market, Tesco, Sainsbury's, Asda and Waitrose are the only retailers to provide a method of purchasing food online. Additionally, Marks and Spencer also provides a non-food online service. The other food retailers in the market simply provide a web presence that advertises the company business. Tesco has been widely acclaimed as the world's number one grocery e-commerce provider with a current online grocery market share of 47 per cent (IGD, 2012). Due to the nature of strict planning policies which Tesco have had to face, the company see online retailing as a strategic advantage which provides faster geographical expansion of Tesco's shopping service provision (Ellis-Chadwick *et al.*, 2007). In addition, with an estimated 27 per cent online market share (IGD, 2012), Asda sits behind Tesco in second place. Recent growth figures of 19.2 per cent this year would also suggest Asda is closing the gap (Asda, 2012). Since the company launched its price guarantee scheme that undercuts rivals by 10 per cent, customers have gone online in their hundreds of thousands to check their receipts. Similarly, Sainsbury's (third largest market share) state in the company's annual report that their online groceries business continues to grow, with annual sales up over 20 per cent between 2010 and 2011 and weekly orders exceeding 130,000 (Sainsbury's, 2011). Their online service can now reach over 93 per cent of UK households, through 187 stores. Additionally, non-food online sales also continue to grow, supported by the introduction of their 'Click and Collect' service, now in over 160 stores, which allows customers the freedom to pick up non-food items ordered online at a store and time convenient for them. Interestingly, possibly due to the success of other retailers, Morrisons has finally announced that it plans to start selling food online in the next two years (Morrisons, 2012).

To date, much of the literature concerning online operators has focused on home delivery services (Ellis-Chadwick *et al.*, 2007), but increasingly grocers are developing a range of delivery options to make online more convenient for customers. Tesco, for instance, is trialling a drive through store enabling customers to pick up orders at a time of their choosing. Sainsbury's is rolling out in-store ordering kiosks and collection points to its convenience store estate. In conjunction, further uptake of smartphones and having a social media/network presence on Twitter and Facebook will also play a key role in fuelling online sales. The mobile phone will increasingly become the 'remote control' of consumption for society, driven by the plethora of more affordable handsets and the continued development of smartphone

applications. For example, within a year of the launch of its ‘Ocado on the Go’ application, Ocado was already receiving more than 12 per cent of orders through the platform (IGD, 2012), while Tesco has captured the public’s imagination with the UK’s first mobile phone barcode scanning application.

5.4 An Analysis of Supply Side Changes

Academic literature from the late 1980s and early 1990s often implied that grocery retailing in Britain was overprovided, even saturated, and that future opportunities for store expansion were extremely limited (Chapter 3). This has been compounded by tight government planning regulations, restricting the ability of retailers to build large new stores. However, the analyses underlying these claims have often been undertaken at a very broad geographical scale. Disaggregation, into regions and LADs reveals more varied patterns of provision, and even that areas are under-provided given their population or spending power (Langston *et al.*, 1998; Poole *et al.*, 2002). As such, the final section of this chapter will concentrate on the major supply-side changes that have occurred since the early part of the twenty-first century in the grocery market. The primary areas of interests will include the geographic expansion of store networks by the major retailers, changes in store formats, future growth opportunities and internationalisation. Once more, specific attention will also be given to the impact of the recession, if any, on the performance of the main retailers in the grocery market.

5.3.1 Retailer Store Network Expansion

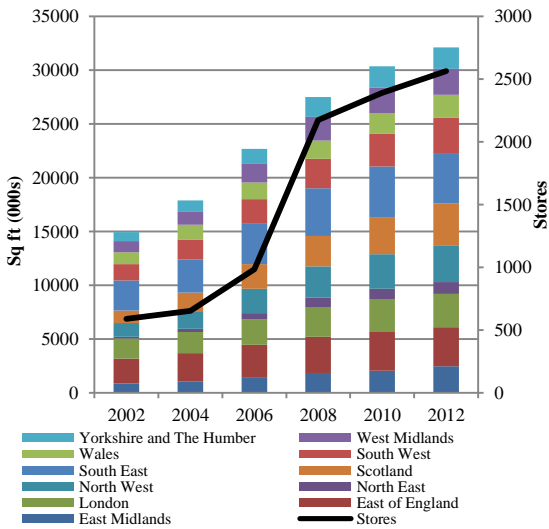
Retail property dominates institutional investment in Britain, accounting for over half of the capital value of direct property assets held by institutions and property companies – making it a hugely influential market (Burt *et al.*, 2010). However despite its importance, during the late 1990s and early 2000s, a number of authors commentated on the limited growth opportunities for grocery retailers (e.g. Wrigley, 1987; Duke 1989; Langston *et al.*, 1998), predicting a slowdown in retail property growth. It is now known that many of these predictions were extremely premature as the major multiples have all continued to expand both organically and through various acquisitions. Therefore, it is useful to consider the regional growth strategies of selected retailers within the grocery market. Figure 5.15 exemplifies the major advancements in store networks for Tesco, Asda, Morrisons, Sainsbury’s, the discounters and Waitrose in GB. The graphs display total floorspace (sq ft 000s) by each GOR along with the total number of stores across Britain. It is important to distinguish between the two due to the different store formats that now exist within the grocery market, a topic which will be explored in the next section in more detail.

Figure 5.15(a) shows that Tesco currently has the highest level of retail provision across GB exceeding 2,500 stores that amalgamate to over £3 million square foot. It is clear that Tesco's growth has remained steady since 2002, increasing both the number of stores and the level of floorspace substantially each year. Initially, in 2002, the data indicate that Tesco had high floorspace provision in the South East, the East of England and London. Moving forward into 2012, these areas still represent one of the primary areas for Tesco; however, the company has clearly made a considerable effort to expand its store network in Yorkshire and the Humber, Scotland and the East of England. A similar pattern is thus reflected in the demand for its stores in Figure 5.9(a). In addition to sustained organic growth, Tesco also expanded through a number of acquisitions between 2002 and 2012. For instance, in 2002, Tesco was given the all clear to push through a £377 million takeover of the 850 T&S convenience stores trading as One Stop, Day & Nite and 350 T&S confectionary and newsagent stores (The Guardian, 2002). By 2006, Tesco had converted 700 of these stores into its Tesco Express format, and still had 500 T&S branded stores. Furthermore, in March 2004, Tesco was cleared by the Office of Fair Trading (OFT) to buy the Adminstore convenience store chain giving it a further 45 new stores in London (BBC, 2004a). This was followed in 2005 by the purchase of 21 petrol stations from Morrisons which were formerly part of a Safeway-BP joint venture (Finch, 2005). This period of takeovers between 2002 and 2005 is reflected in Figure 5.15(a) by the sharp rise in the number of stores in 2008. Tesco have clearly identified the convenience market as a key strategy for growth since the turn of the century, as it went on to acquire 77 outlets from Mills Group for £20 million in 2010 (Guardian, 2010). Furthermore, after announcing the first fall in UK profits for at least 20 years, the company has unveiled it is expected to scale back openings of big stores and store extensions, focusing instead on smaller stores and growing its online presence (Financial Times, 2012). If other retailers were to follow suit, this behaviour could spark fresh claims that the 'race for space' among British grocers could be coming to an end.

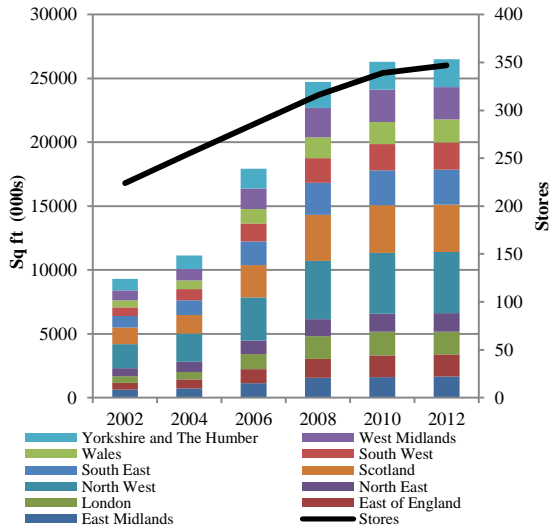
In comparison, Asda (Figure 5.5(b)) shows a more gradual growth in the number of stores for Asda. In 2001, Asda's floorspace had a high regional concentration, highest in the North West and Scotland, two regions they continued to expand within year-on-year. In addition, Asda have also concentrated on expanding in the West Midlands, Yorkshire and the Humber, the South East and London (to an extent). With regard to expansion in the South East and London, Asda pushed through a massive expansion starting in 2008 in an attempt to increase its competition against Tesco and Sainsbury's in the south of the country. Additionally, Asda also opened a number of 'ethnic stores' in 2009 in a bid to win more Asian customers (BBC, 2009), a strategy the company have been committed to in other parts of London and cities with large ethnic minority populations. Interestingly, the floorspace in Yorkshire and the Humber is not as high as expected considering the high market share figures in the region in Figure 5.9(b). This would

indicate there is probably a strong regional attraction to the brand per square foot compared to say Tesco or Sainsbury's for example. Also in 2010, the American company Wal-Mart 'sold' Asda for £6.9 billion to their Leeds-based investment subsidiary Corinth Services Limited (The Grocer, 2009). In reality, the deal was more of a group restructuring since Corinth is a subsidiary of Wal-Mart - meaning Asda actually still remains under the control of Wal-Mart. Most recently, in May 2010, Asda bought 193 Netto stores across the UK at a cost of £778m (Goodley, 2010). After struggling to keep pace with its rivals during the recession, the deal was done to move Asda into the smaller, more localised store market. Nevertheless, in September 2010, it was announced that Asda would be forced to sell 47 of the existing 194 Netto stores due to a ruling by the Office of Fair Trade (OFT). This increase in store size is not reflected in Figure 5.15(b) as the GMAP data still lists Netto separately, primarily because the rebranding of the Netto stores did not begin until 2011. Moving forward, Asda has also announced it is to create 5,000 new jobs in 2012 as part of a £500 million expansion. The retailer will open 25 stores, refurbish 43 existing outlets and invest in three new depots during the course of 2012 (The Guardian, 2012).

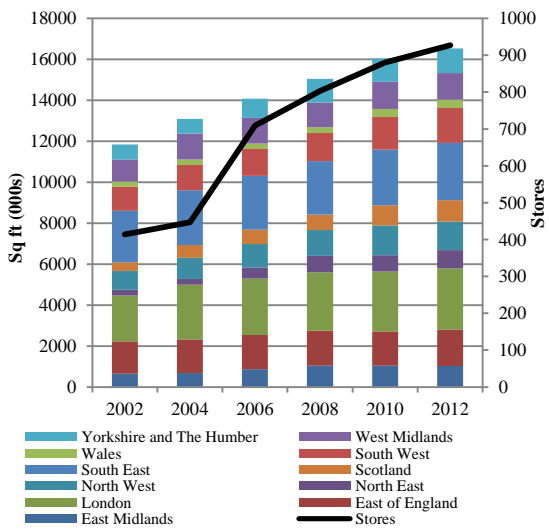
Overtaken by Asda in 2003 as Britain's second largest retailer, Sainsbury's have followed a somewhat similar expansion strategy to Tesco with a consistent growth in floorspace year-on-year. However, unlike Tesco, Sainsbury's still has a level of regional concentration. In 2002, Sainsbury's had high floorspace provision in London, the South East and the East of England, areas where the company still records its highest floorspace figures. This is reflected in figure 5.9(c) which demonstrates very high levels of demand in these areas. Again, similar to Tesco, Sainsbury's also expanded through a number of acquisitions as it moved it into the convenience market. More specifically, in March 2004, Sainsbury's purchased 50 stores associated with the Bells chain. This was shortly followed in October 2004 by the acquisition of 114 Jacksons' stores in Yorkshire and the North Midlands (BBC, 2004b). These two takeovers are the reason for the large increase in store numbers and square foot rise in Yorkshire and the Humber in during 2006. More recently, in 2009, Sainsbury's bought 24 stores from the Co-operative, 22 of which were Somerfield stores and the remaining two were Co-op stores. This was because the Co-operative were required by the OFT to sell 126 stores after the completion of the £1.57 billion Somerfield takeover in 2008 to address competition concerns in some local grocery markets (BBC, 2008). A further nine stores were also purchased by Sainsbury's, concentrated in Wales, the north of England and Scotland where Sainsbury's market share is low.



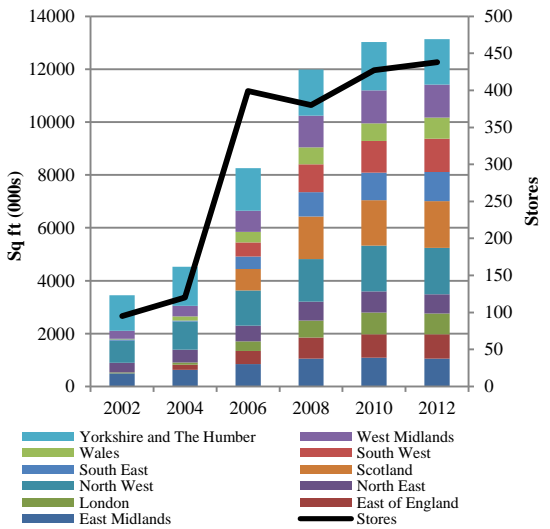
(a) Tesco



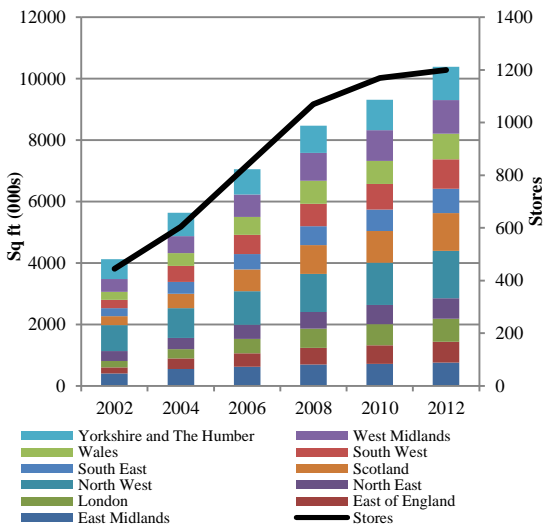
(b) Asda



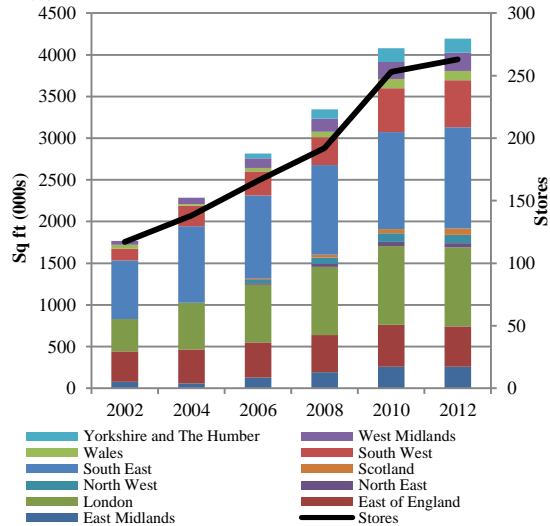
(c) Sainsbury's



(d) Morrisons



(e) Discounters



(f) Waitrose

Figure 5.15. Regional changes in floorspace and national store numbers by selected retailers in GB, 2002 to 2012.

Sources: GMAP (2002 to 2012)

Next, let us consider the expansion of Morrisons, the last of the ‘big four’ retailers. It is evidently clear that in 2002 the majority of the company’s floorspace was constrained to northern England, in particular Yorkshire and the Humber, and the North West. Overtime, Figure 5.15(c) demonstrates how Morrisons has expanded outwards across the other regions of GB. Subsequently, in today’s market, Morrisons still maintains a high level of floorspace in Yorkshire and the Humber (where the company originated). However, there has been considerable expansion into Scotland, the South West and London. The substantial growth across the country is further compounded by the large increase in store numbers between 2003 and 2005 in Figure 5.15 (c). This sharp rise reflects the acquisition of Safeway by Morrisons which went through in 2004 for around £3 billion (BBC, 2004). Whilst other retailers were interested in purchasing Safeway also (CC, 2003: cited in Hughes *et al.*, 2009), Morrisons was given the all clear by the CC as it was believed the merger had the potential to create a fourth national champion to rival Asda, Sainsbury’s, and Tesco, hopefully improving competition, lowering prices, and improving quality for consumers. There were also less issues regarding local monopolies as Safeway’s market share was focused to southern England and Scotland, the opposite of Morrisons (Poole *et al.*, 2002). Nevertheless, as is often the case, the CC only cleared the deal on the basis that a number of stores had to be sold off due to concerns over local market shares (Burt *et al.*, 2010) – explain the slight decline in 2008. For example, 11 stores were purchased by Waitrose (Guardian, 2005), and through the termination of the joint venture between Safeway and BP, five sites were subsequently sold to BP, Somerfield and Tesco. Latterly, in December 2008, Morrisons also reached an agreement to buy 38 Co-op and former Somerfield stores for £223.1 million (BBC, 2008). Once more, as many of these stores were located in the south, it highlights how the south (in particular London) is becoming a key area for growth moving forward for Morrisons.

Outside of the ‘big four’, the discounters (Aldi, Lidl and Netto) have also had quite impressive expansion strategies since the early part of the twenty-first century. Figure 5.15(e) highlights how the collective floorspace and total number of stores has increased consistently every two years. Unlike the other retailers discussed, the discounters have all expanded organically at a steady pace. Table 5.5 disaggregates the discounters into the individual brands to exemplify the different strategies they have taken. On observing Table 5.5, Aldi has clearly moved out in all directions from their early base in the North West and Midlands with new stores in the South East, Wales and Scotland. Lidl opted to move towards a blanket coverage of GB whilst Netto has perhaps been more cautious, not straying too far from its initial northern base (with the exception of London). Nevertheless, whilst the overall growth in the number of discount stores has been impressive, some planned strategies did not come to fruition. For example, Netto’s highly publicised £200 million investment in 70 new sites in South Wales never materialised.

Furthermore, as previously mentioned after a dip in fortunes, Netto sold its assets to Asda for £778 million (Thompson *et al.*, 2012). Conversely, Aldi opened 50 new sites in 2009 and held planning permission on a further 29 sites at the start of 2010 (The Grocer, 2010). Additionally, Lidl held 22 sites with planning permission for new stores at the start of 2010 (The Grocer, 2010). Thus it seems that growth in GB remains very much on the agenda for the discounters. Moving forward, clearly there are still gaps in market share across the country from Figure 5.10(a) and consumers are still continuing to shop at the discounters (Figure 5.11(a)). The big question remains as to whether the gaps are in areas where the discounters already have a strong market share, or will they need to venture into pastures new?

Table 5.5. Discounter store expansions by sq ft from 2002 to 2012 across GB

Retailer	Aldi (sqft)		Lidl (sq ft)		Netto (sq ft)	
	2002	2012	2002	2012	2002	2012
East Midlands	214,000	360,998	91,000	311,841	98,000	90,000
East of England	90,000	284,029	87,000	343,792	19,000	48,000
London	47,000	121,140	167,000	580,228	0	42,000
North East	113,000	268,838	78,000	241,421	133,000	156,000
North West	559,000	792,518	117,000	499,226	162,000	258,000
Scotland	46,000	377,723	237,000	849,292	12,000	0
South East	63,000	240,607	179,000	506,086	13,000	42,000
South West	75,000	230,862	202,000	731,518	0	0
Wales	83,000	305,314	173,000	495,284	6,000	30,000
West Midlands	289,000	500,075	80,000	461,732	41,000	132,000
Yorkshire & Humber	190,000	305,612	79,000	410,293	377,000	366,000
Total	1,769,000	3,787,715	1,490,000	5,430,712	861,000	1,164,000

Source: GMAP Ltd, 2002 – 2012

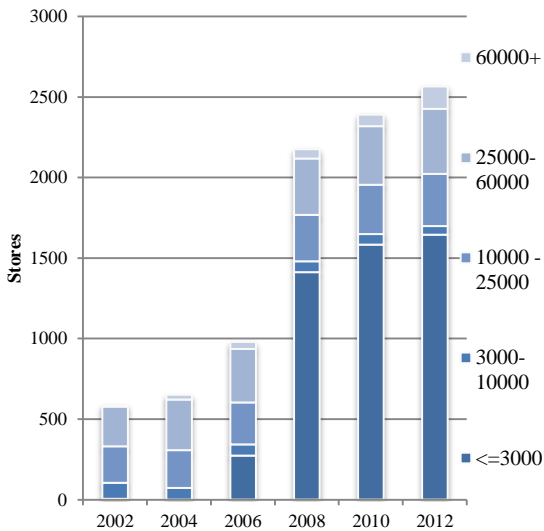
The final retailer displayed in Figure 5.15(e) is Waitrose, identified so far in the thesis as one of the success stories of the recession. As such, it is important to try and understand the nature of the company's growth in terms of its store networks. In Figure 5.10(e), it was shown that Waitrose's market share is highest in the South East and London regions. From observing Figure 5.15(e) it can be argued that this is a direct result of the large floorspace Waitrose has in these two regions. Nevertheless between 2002, and 2012, there has been an effort to expand outwards into the South West, the East of England, Yorkshire and the Humber and, more recently, Scotland. This takes the company to over 250 stores across GB. In the same way as the discounters, due to the small nature of Waitrose in comparison to the 'big four', it has had to grow more organically. This is indicated by the steady rise in store numbers and floorspace. However, in order to fit with its long term strategy to evolve into a national retailer, where possible, Waitrose have also attempted to pick up stores through other strategies. For instance, in 2000 Waitrose purchased 11 stores from rival Somerfield 24 stores from Safeway between 2004 and 2005 (as stated), six stores from Morrisons between 2005 and 2006. In addition, in

2008, Waitrose announced the acquisition of four Woolworths store sites and in January 2009, Waitrose announced that they had acquired 13 sites from The Co-operative Group.

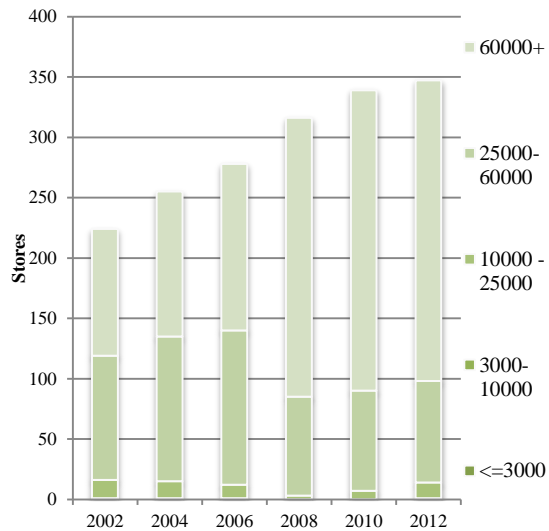
5.3.2 Changing Store Formats

In addition to trends in the actual number of stores and total floorspace across GB, it is also important to understand the various changes to store formats over the last ten or so years. For a long time in the grocery market, the blueprint was to build large out-of-town supermarkets as increasing mobility meant these types of stores would be most preferable. However, due to changes in the structure of the population, new planning policy regulations and shifting consumer demand, retailers have had to adapt the range of stores in their network portfolios. Consequently, Figure 5.16 exemplifies the different types of stores for selected retailers that exist in the grocery market classified by their size (sq ft). The classification is that used by IGD and states the following; convenience (less than 3,000 sq ft), small supermarkets (3,000 to 9,999 sq ft), large supermarkets (10,000 to 24,999 sq ft), superstores (25,000 to 59,000) and hypermarkets (over 60,000 sq ft).

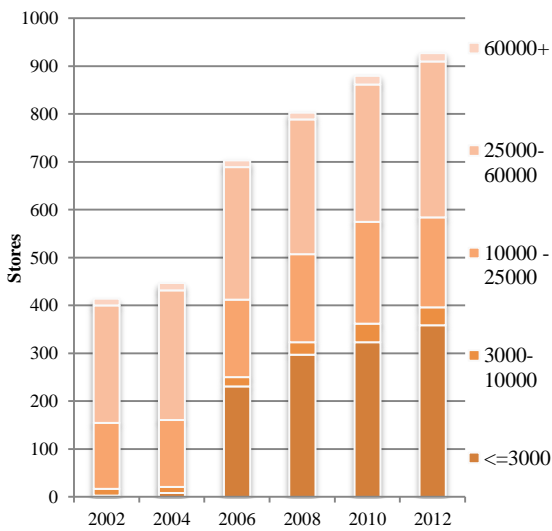
First of all, Figure 5.16(a) indicates that Tesco has stores which fit into each of the different formats. Burt *et al.* (2010) discuss the range of Tesco stores and their history in more detail. Nevertheless, the main formats in order of size include Tesco Express, Tesco Metro, Tesco, Tesco Extra and Tesco Homeplus. However, it has not always been like this for Britain's number one retailer. For example, in 2002, Tesco's store networks were primarily between 3,000 sq ft and 59,999 sq ft in size. Since then, Tesco have invested heavily in the convenience store market through its various acquisitions and also built a number of large hypermarkets. This polarisation has meant the medium sized stores are being squeezed out of the market to an extent. The growth of the larger hypermarkets is interesting, as it suggests that despite strict planning regulations, Tesco have still been able to build their large out-of-town stores. A similar pattern is also seen with Asda in Figure 5.16(b), as it too has continued to increase the number of large 60,000 sq ft stores over time. However, as the total number of stores has not increased as rapidly, it would suggest that Asda have undertaken a considerable store extension programme. The difference with Asda is that it has resisted the option to move into the convenience sector, with all of its stores being greater than 10,000 sq ft. The purchase of Netto (not included in Asda data), however, suggests that Asda is aware that it needs to deliver smaller supermarkets to meet the needs of local communities, to reach more customers in markets that are currently underserved by Asda.



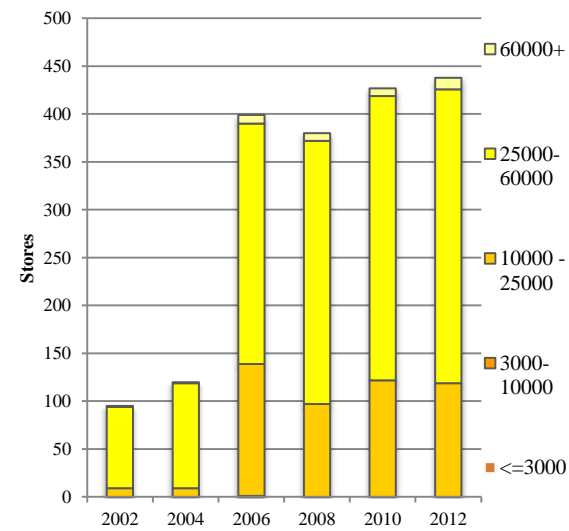
(a) Tesco



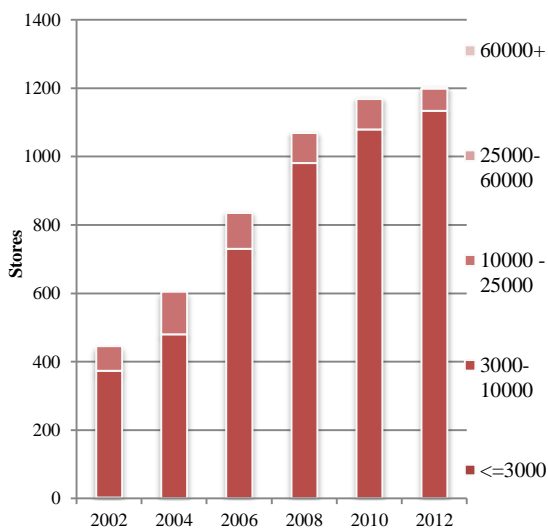
(b) Asda



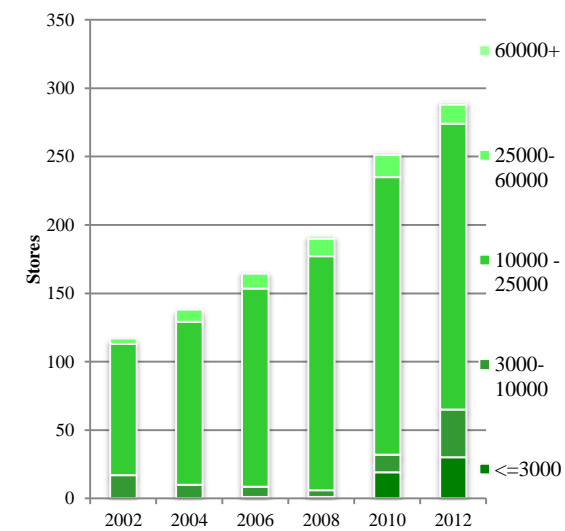
(c) Sainsbury's



(d) Morrisons



(e) Discounters



(f) Waitrose

Figure 5.16. Store format for selected retailers between 2002 and 2012 in GB

Sources: (GMAP Ltd 2002 to 2012)

Similarly to Tesco, Sainsbury's also has an extremely varied network of stores. These include Sainsbury's Local, Sainsbury's Central and Sainsbury's supermarkets. Unlike Tesco (Tesco Extra) and Asda (Asda Wal-Mart Supercentre), Sainsbury's does not employ a separate brand for its hypermarkets, having phased out the 'Savacentre' fascia several years ago. Since 2002, Figure 5.16(c) shows how the retailer has increased the number of smaller convenience stores. Furthermore, in a contradictory strategy to Asda and Tesco, Sainsbury's appear to have concentrated far less on the construction of large hypermarkets. Whilst it has continued to build them, it appears to have been at a much slower rate than supermarkets and superstores. Morrisons has also traditionally supplied stores that are greater than 10,000 sq ft, exemplified by Figure 5.16(d). However, in 2011, Morrisons announced it would open its first convenience store in Ilkley, Yorkshire. The new format (branded M-local), was the first of a three store trial to evaluate and refine Morrisons convenience offer. As many of these stores are still in a trial phase, the challenge for Morrisons is to maintain its core values and appeal as it continues to expand. Consequently, to ensure it differentiates itself from its rivals, M-local stores are designed to have a greater emphasis on fresh food, skilled craftsmen and women, increased affordability and guaranteed freshness (Morrisons, 2012). Since launching its first M-local format, Morrisons has opened five stores so far, and promised to open 20 by the end of 2012 and 70 by the start of 2014 (Morrisons) – there is also speculation that Morrisons has held exploratory talks with Costcutter, as it seeks to gain a serious foothold in the convenience market.

Since arriving in GB in the early 1990s, the discounters have been much more consistent with their store formats. As mentioned, the standard model for a discount store is one with low operational costs built on relatively cheap land (Colla, 2003). Based on the data in Figure 5.16(e), it would appear that this is a format between 3,000 and 10,000 sq ft in size. Since 2002, the discounters have been committed to rolling this format out as it is clearly one which works for them. In comparison, Waitrose have attempted to be more varied with their stores. Initially, in 2002, much like the discounters, Waitrose was associated with the 'traditional' supermarket format. However, today we see a range of different store types. For instance, since purchasing a number of stores from Somerfield and Safeway it now has a selection of stores under 10,000 sq ft. Furthermore, after announcing its venture into the convenience sector in July 2008, a large-scale roll-out of the 'Little Waitrose' concept has been planned, opening up to 300 stores in the next five to ten years. Trading from 2,500 to 4,000 sq ft, the majority of sites are expected to be opened in London and are believed to be a direct challenge to the M&S's Simply Food format.

Whilst Figure 5.16 provides a clear understanding of the changes in retail format over the last ten years, it does not identify any geographic difference between them. This is important when

trying to understand the impact of the different formats on different parts of the country. Consequently, Figure 5.17 demonstrates the percentage of stores that fit into each of the format categories by the Vickers and Rees (2007) LAD classification. It must be noted that only the stores associated with Tesco and Sainsbury's were used as these retailers have the most diverse store portfolios. The percentages are also provided in an index where 100 is the average to standardise the data. This is because there are far more stores in the more urban areas compared to the rural classifications. This index was calculated as followed:

$$I_{fl} = \frac{P_{fl}}{\bar{P}_{fl}} \times 100 \quad (5.2)$$

where, I_{fl} represents the index value for each store format (f) in each LAD class (I), P_{fl} is the percentage of stores by format (f) in each LAD class (I), and \bar{P}_{fl} is the mean of P_{fl} for GB. First of all, it would appear that the convenience stores (<3,000 sq ft) are dominant in 'Multicultural inner London', the 'City of London', 'Central London' and 'Coastal resorts'. London is clearly an area where there is a much greater demand for convenience retailing. This is arguably down to long working hours in the city and the high percentage of smaller households. Furthermore, the high rental costs for land in the capital could mean smaller shops are simply more affordable for retailers. In addition, the above average level of convenience stores in 'coastal resorts' suggests Sainsbury's and Tesco are using their Local and Express formats respectively to target rural coastal villages. It is likely that both retailers would face strong opposition to large supermarkets in these types of areas.

In terms of the supermarket formats (3,000 to 10,000 sq ft and 10,000 to 25,000 sq ft), Figure 5.17 displays a pattern of increasing rurality with larger stores. For example, whilst many of the smaller supermarkets still remain prominent in the 'city of London', 'central London' and 'multicultural inner-London', areas defined as 'rural extremes' and the 'M8 corridor' also contain above average numbers. This becomes even more prominent for larger supermarkets as there are high levels of 10,000 to 25,000 sq ft supermarkets in the 'commuter belt', 'aged coastal extremes' and the 'rural fringe'. This is consistent with the literature which argues that larger supermarkets are being located in out-of-town areas. This continues with the large superstores (25,000 to 60,000 sq ft) as they too appear to be located in areas termed 'rural extremes', 'aged coastal extremes' and the 'M8 corridor'. It may be expected that this would follow explicitly for large hypermarkets. However, Figure 5.17 highlights a somewhat mixed spatial pattern. For instance, there are still high figures for the 'M8 corridor' and 'outer London'. However, those areas that show the highest values are 'regional centres' and 'typical

towns'. This is likely because the large 60,000+ sq ft stores still need a considerable population to ensure profits as simply locating in very rural areas is not enough for this format of store.

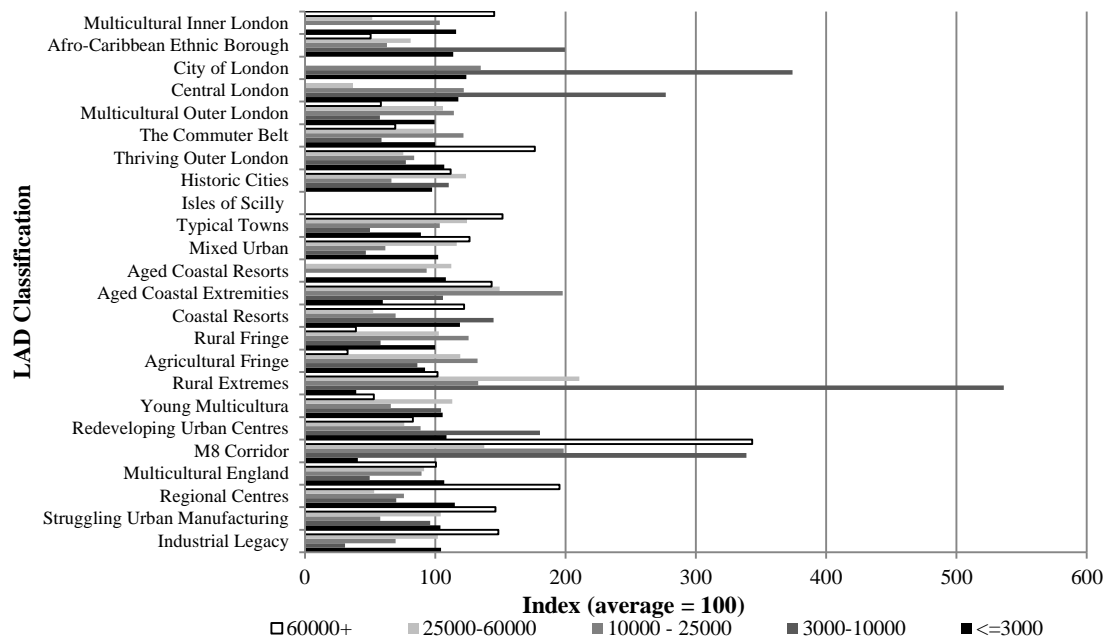


Figure 5.17. Tesco and Sainsbury's store formats by LAD classification in GB, 2011
 Source: Vickers and Rees (2007); GMAP Ltd. (2012)

5.3.3 Potential Growth Opportunities in the Future

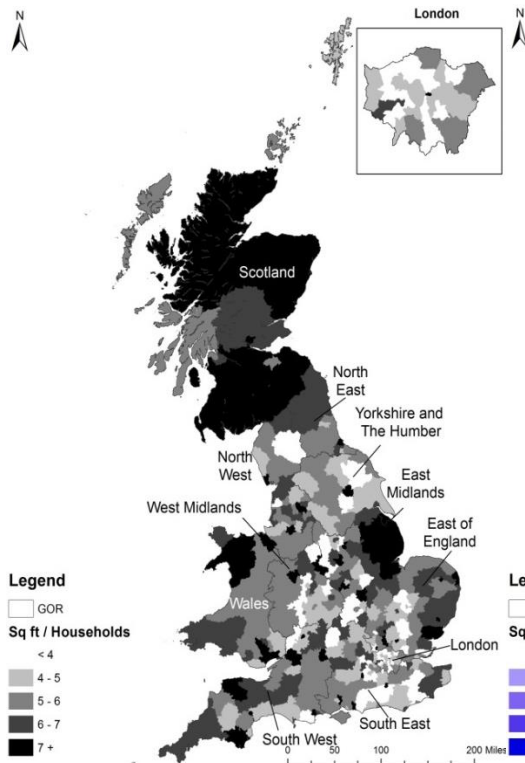
Contrary to many predictions, the evidence provided has revealed a continuation of growth in the grocery market with regards physical retail space over the past ten years. However, fuelled by a mixture of new store openings and large-scale acquisitions, the concept and threat of market saturation is once again beginning to resurface. Therefore, in this section, attempts are made to challenge the common misconceptions regarding the extent of saturation and levels of competition across the country at a sub-regional level. This is achieved through the use of floorspace-per-household as an indicator for potential growth. Floorspace-per-household has been used previously by Langston *et al.* (1997, 1998) and Poole *et al.* (2002) and provides a useful measure to assess the spatial variations in market concentration for major multiples.

Figure 5.18 represents floorspace-per-household for each LAD across GB in 2011. The maps are also broken down to highlight the differences between total sq ft per household in the grocery market and the individual values for Tesco, Asda, Sainsbury's, Morrisons and the two discounters (Aldi and Lidl). Waitrose has not been included in this instance because the retailer has such a low market share relative to the other retailers and thus hypothetically should be able to locate anywhere. In the first instance, Figure 5.18(a) shows that overall, Scotland is largely overprovided with regards to grocery retail space. The average for GB is 5.7 sq ft per household

and LADs in Scotland display figures above 6 and 7 sq ft per household. Other areas of high provision include areas in the East Midlands, the North East and North Wales. This spatial pattern remains broadly consistent with Poole's (2002) findings. Interestingly, the South East and north London were also identified as having high levels of retail provision. However, ten years on this no longer seems to be the case. Figure 5.18(a) illustrates that the South East has much lower levels of floorspace-per-household and so too does north London. This is arguably due to an increase in population within these areas since 2002. Data from the 2011 Census demonstrates these areas have witnessed some of the highest levels of growth across the country. Combined with the increased levels of grocery expenditure exemplified in Section 5.3.1, this is encouraging for the grocery retailers as it would suggest previously 'saturated' markets are now opening up due to demographic shifts.

In terms of the individual retailers, due to their expansive store network, Tesco has very high levels of provision in most areas. The highest levels are concentrated in Scotland, Wales, the East of England and parts of the South East. Nevertheless, it would appear that the retailer still has room to expand further in the coming years. The North West (Cumbria) and Yorkshire and Humber (Harrogate, Wakefield, Leeds and Ryedale) for example, still show relatively low levels of provision. It must be noted, however, that further investigation would be recommended to ensure low representation in certain areas is not just a factor of their rural location and low population density. The opposite could be said for some LADs appearing to lack provision, a result of high building density and thus a lack of available space for large-scale grocery outlets. Either way, given Tesco's range of store formats, the retailer is still well placed to exploit the current gaps in the market.

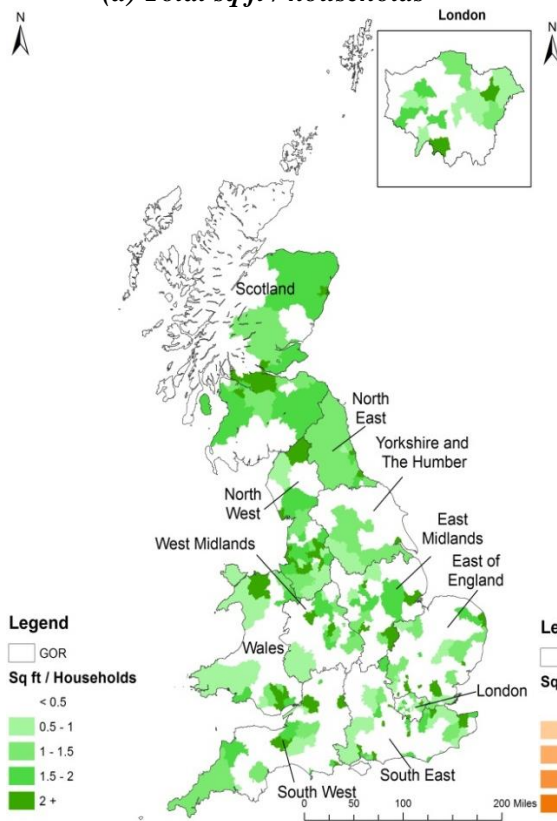
In Figures 5.18(c) and 5.18(e), Asda and Morrisons demonstrate a very similar pattern of provision and potential opportunity. Whilst Asda has clearly expanded further in terms of actual floorspace levels, the spatial variation between the two remains consistent. Yorkshire and the Humber (in particular Leeds, Bradford and parts of West Yorkshire) are relatively more provided than most parts of the country. This is reflected by high levels of demand in Section 5.3.2 which suggests it would be difficult for both retailers to expand in the region. This is why the CC instructed Asda to sell off a large proportion of the Netto stores acquired in 2010, as the region signified one of Netto's strongest areas. Looking forward, both retailers will be well placed in their expansion into the South East. Neither retailers show an over-provision in the region and their local market shares would likely pass rulings from the 2008 CC test (cited in Hughes *et al.*, 2009)



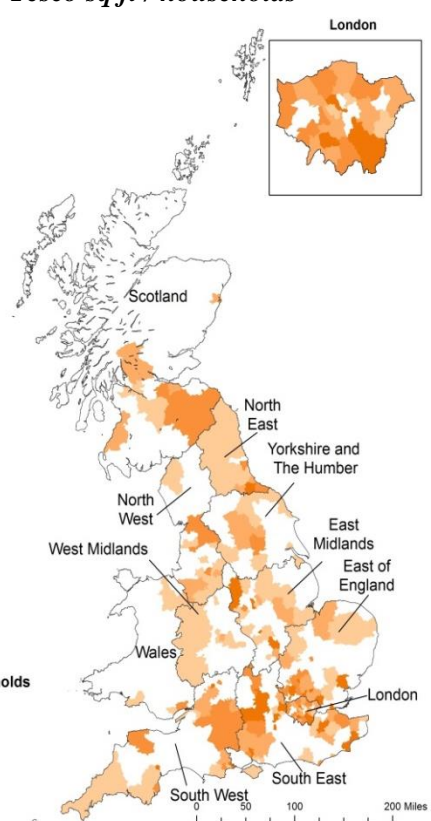
(a) Total sq ft / households



(b) Tesco sq ft / households



(c) Asda sq ft / households



(d) Sainsbury's sq ft / households

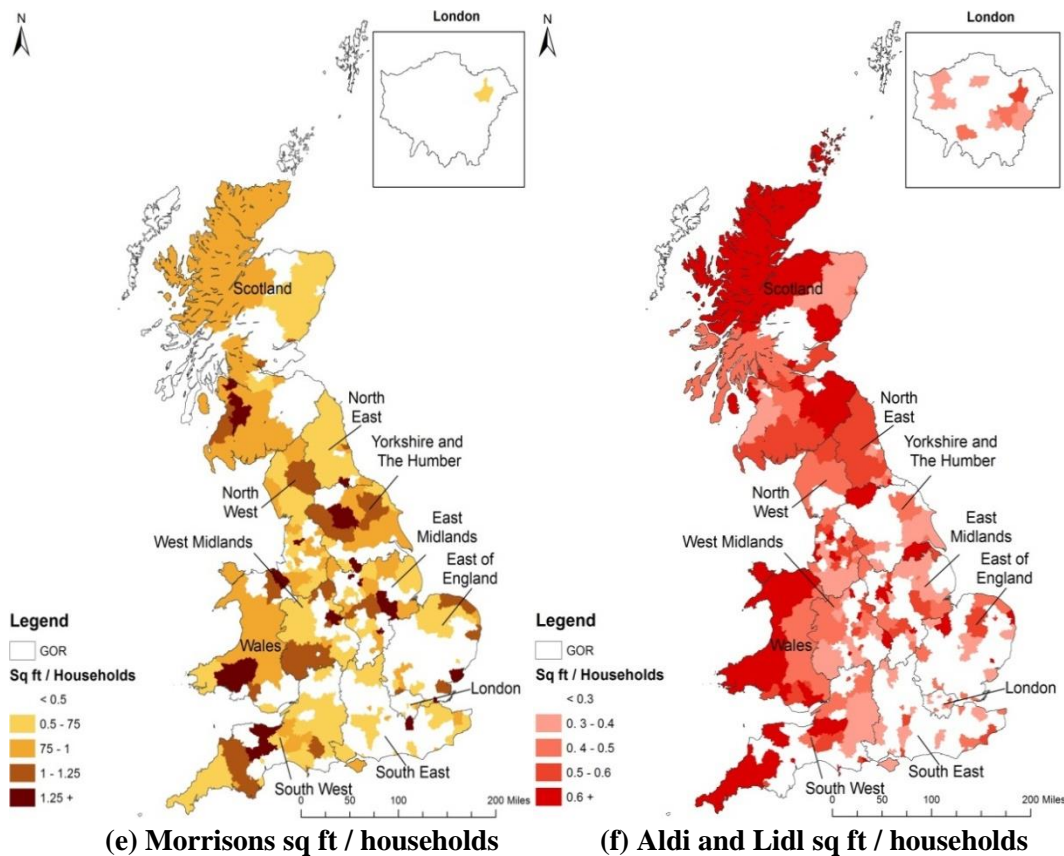


Figure 5.18. Floors pace-per-household in LADs across GB, 2011

Source: GMAP Ltd (2011); Census (2011)

Sainsbury’s opportunities for growth are almost a mirror image of Asda and Morrisons. More specifically, whilst the retailer is a long way from reaching the level of floorspace achieved by Tesco, Figure 5.18(d) highlights the comparative dominance of the retailer in the South East. However, this is not consistent across the whole region. Areas such as Guildford, Chichester Waverly and the south coast still show low levels of provision relative to the number of households. Based on the information presented in Section 5.3.2, it may have been expected that Sainsbury’s was reaching their limits in the area. However, the recent population growth in the South East would suggest there is still room to expand within Sainsbury’s traditional heartlands. The rise in population may also have been a contributing factor to the success of Sainsbury’s and Waitrose during the recession, counteracting the reduction in grocery expenditure across the region. In contrast, Figure 5.18(f) exemplifies the retail provision of the discounters. In this instance, only Aldi and Lidl have been included because of the acquisition of Netto by Asda. Compared to the ‘big four’ retailers, the discounters have a much lower level of retail provision. Thus, both Aldi and Lidl have wide ranging opportunities for growth. Nevertheless, in relative terms, the discounters have high levels of floorspace-per-household across the Midlands,

northern England, the South West and Wales. Once again, the greater London region and the South East portray places of under-provision.

5.3.4 Internationalisation of British Retailers

Due to the extensive research into the state of the domestic British grocery sector, the remaining part of this chapter will concentrate on the role of internationalisation. The last two decades have been characterised by an increasing internationalisation of retail activity and a considerable number of academic attempts to classify or categorise this activity (Burt *et al.*, 2008). The initial internationalisation of British grocery retailers during the late 1990s has already been discussed in Chapter 3. However, further international moves have also occurred since the early 2000s, which may have had different motivations to those taking place during the ‘golden age’ of capital concentration and accumulation (Wrigley and Lowe, 2002).

Tesco, arguably the UK’s most successful retailer can serve as an example of successful internationalisation (Burt *et al.*, 2010). Tesco has turned from a company dominated by UK food superstore retailing to one where the sales floorspace outside the UK is greater than that inside the UK. Recent store number growth has been focused internationally and profit and turnover growth is faster internationally than in the UK (Seth and Randall, 2005). Table 5.6 exemplifies Tesco’s current aggregate store counts across international markets. It is clear from the data provided that Tesco now have strong presence across many continents. Since 2002, there have been signs of a consolidation process underway, with focus upon strong markets and a rigorous review of activities in ‘weaker’ markets leading to divestment in several instances.

Table 5.6. Tesco internationalisation

Country	Year entered	Stores	Area sq ft	Mean sq ft	Stores 2011-2012
Poland	1992	412	8,906,000	21,617	41
Hungary	1994	212	7,301,000	34,439	7
Czech Republic	1996	322	5,797,000	18,003	61
Slovakia	1996	120	3,627,000	30,225	23
Republic of Ireland	1997	137	3,440,000	25,109	7
Thailand	1998	1,092	12,831,000	11,750	310
South Korea	1999	458	12,551,000	27,404	59
Malaysia	2002	45	3,778,000	83,956	7
Japan	2003	121	396,000	3,272.7	-19
Turkey	2003	148	3,628,000	24,514	27
China	2004	124	9,622,000	77,597	19
United States	2007	185	173,279	936.64	21
Europe non-UK		1,351	32,699,000	24,204	166
Asia		1,840	39,178,000	21,292	376
Total non-UK		3,376	73,747,000	21,342	563

(Source: Tesco, 2012).

In terms of internationalisation, Tesco has lived up to its self-declared strategy and so far has acted a multi-format strategy. More specifically, Tesco has adopted two major strategic alternatives available for international retail expansion: 'global' and 'multinational' strategies. Global retailers replicate a standard format throughout the world, whereas multinational retailers adapt their retail offering (Sternquist, 1997). In the newly created markets in central Europe, Tesco entered its first and culturally most proximate markets with a fairly unchanged retail model ('global'). For example, Tesco opened its first stores in the Czech Republic in 1996 by buying US corporation Kmart's operations in the country and converting them into Tesco stores. Furthermore, Tesco also opened in Hungary in 1994 after purchasing a small local supermarket group trading as S-Market. Recently, Tesco have moved to open large hypermarkets in the country, building their first Tesco Extra in Hungary in 2010 and a second in 2012.

In East Asia, Tesco has adopted a multinational strategy, often following a partnership approach whereby it gives initial scale and access to knowledge of local political and institutional conditions (Palmer, 2005). Such partnerships are often followed by the acquisitions of larger stakes (Wrigley, 2005). For example, in Thailand, where transportation is expensive but labour is relatively cheap, Tesco adapted its logistics to this situation. It has developed a low cost 'value' format for up-country expansion – a hypermarket format surrounded by leased space for local fresh fruit and vegetable vendors which provides a vehicle for entry into neighbouring economics (Wrigley, 2005). In China, Tesco also acquired a 50 per cent stake in the Hymall chain from Ting Hsin in 2004; it later raised its stake to 90 per cent in 2006 in a £180 million. Additionally, in 2008, Tesco announced their intention to invest an initial £60 million to open a wholesale cash-and-carry business based in Mumbai with the assistance of the Tata Group. Furthermore, Tesco Japan first began operations in 2003, brought about by a buy-out of C Two stores for £139 million in July 2003 and later Fre'c in April 2004. Nevertheless, in 2011, Tesco announced it would be paying rival Aeon a £40 million dowry to take the stores off its hands after revealing that only half of the stores in the Greater Tokyo Area were making a profit (Tesco, 2012). Historically, foreign retailers have struggled to conquer Japan due to the toxic combination of intense competition and years of lacklustre economic growth. French giant Carrefour pulled out of Japan in 2005 when some of its stores were also acquired by Aeon. The disinvestment of Tesco from Japan is not the only example of the retailer struggling in international markets. Other examples of disinvestment include the sale of Tesco stores to Carrefour in Taiwan after only one year in the market in 2005. The deal cost Tesco £39 million in which it exchanged six stores in Taiwan for Carrefour's eleven outlets in the Czech Republic and four in Slovakia (BBC 2005). More recent examples of withdrawal from international markets include the closure of Tesco's Vin Plus outlet in Calais (only French store) which sold wine, beer and spirits during 2010.

These recent withdrawals (in particular Japan) immediately put the spotlight on its American business, Fresh & Easy. Tesco has since pulled out of the US after never making a profit in five years, at a cost of £1.2 billion (BBC, 2013). Tesco entered the grocery market in 2007 through the opening of a new chain of convenience stores, on the West Coast (Arizona, California and Nevada). More than 100 stores were planned in the first year; a store opening every two-and-a-half days. However, due to the recession which hit America in 2008, this planned rate of expansion was not maintained. Nevertheless, despite the negative media reports of the Fresh & Easy chain, Lowe and Wrigley (2009) and Lowe *et al.* (2012) reveal considerable strength in the US brand that Tesco has created. However, no one foresaw the hit that the US economy would take, with some of the markets Tesco had targeted being the worst affected by the recession. (Lowe *et al.* (2012) predicted that company were being so innovative that they could be slightly ahead of the game – it is now known this is not the case. It seems the failing internationalisation became too much to carry during a time when Tesco is starting to scale back its UK operations - more specifically a £804 million write-down in the UK property portfolio after identifying more than 100 sites that will not be developed, bought mainly during the property boom more than five years ago (BBC, 2013).

Despite the documented problems, in comparison to other British grocery retailers, Tesco can still show a handful of market-share leaderships in foreign markets and each country mastered gives the retailer a broader international knowledge base. For instance, whilst Asda forms part of a wider international business through Wal-Mart – the Asda fascia only exists in the UK. Moreover, despite the sheer scale of the business, the key elements of its business model have often proved difficult to transfer because of established economic and social norms of behaviour to a host market – perhaps best illustrated by its failure in Germany in 2006 (Burt and Sparks, 2006; The Independent, 2006). In addition, despite a number of attempts at retailing in foreign countries, Sainsbury's has had little success. More specifically, after expanding into America by purchasing the Shaw's chain in 1987, Sainsbury's sold its American subsidiary to Albertsons for £1.18 billion in 2004 (El-Amir and Burt, 2007). Sainsbury's Egyptian subsidiary, Edge SAE, was the company's second international assignment after the USA. After a number of deals in which Sainsbury's gradually increased its share in Edge, the first supermarket in Egypt to trade under the Sainsbury's banner opened in February 2000, and by November 2000 Sainsbury's operated 106 supermarkets and neighbourhood stores in the greater Cairo area (El-Amir and Burt, 2007). However, soon after in 2001, the company sold the subsidiary to its Egyptian partner, resulting in a consolidation of sales costing of £24 million and £80 million, generating operating losses of £11 million and £24 million respectively (El-Amir and Burt, 2007). The move into Egypt was met with mixed feelings by customers, however the retailer themselves

put the closure down to difficult trading conditions and the deteriorating political situation in the Middle East at the time.

Slightly more positive examples, but by no means as successful as Tesco, include Marks and Spencer. In 2001, Marks and Spencer closed all 38 of its European shops as problems hit them hard at home (Burt *et al.*, 2002). Some of the Spanish shops quickly reopened and were augmented by a couple of new ones a few years later. The company reopened its Paris store on 24 November 2011, following the launch of a new French website on 11 October 2011. Furthermore, in the Philippines, there are 18 Marks and Spencer stores. There are currently shops located in 41 countries across the Middle East, Asia and Europe (Goodley, 2010). Perhaps the most interesting has been the recent move out of the UK by Waitrose. Buoyed by its impressive and sustained growth since the recession, Waitrose has expanded its store portfolio with outlet openings in Bahrain and the Channel Islands in 2011. The retailer has also announced it will continue to extend its brand equity through the distribution of its own brand products in the US and Canada, as it maintains a two-pronged international development strategy (Waitrose, 2011; Verdict, 2011). In the UK, Waitrose has built up a strong reputation for selling high quality food products, allowing it to leverage the strength of its brand and expand its reputation for premium food products on a global level. For example, in 2010, Waitrose announced plans to distribute its Duchy Originals from Waitrose range to retailers of a similar reputation in the US. Waitrose is now capitalising on the growing equity of its brand with plans to distribute its private label products to the US and Canada (Verdict, 2011). This move into North America will boost Waitrose's export business, promote the quality perception of the brand worldwide and help raise the standing of the Waitrose name as a credible fast-moving consumer goods brand in its own right. Looking to the future, recent comments from senior representatives suggest that Sainsbury's, Marks and Spencer and Waitrose are still committed to expanding in overseas markets (The Guardian, 2012). The target areas are not surprisingly believed to be the growing markets of India and China. Nevertheless, given Sainsbury's and Marks and Spencer's international history and the fact Waitrose have only recently expanded out of the UK - all will be undoubtedly be cautious. Internationalisation still remains a non-linear, on-going, dynamic activity involving developments, impacts and retrenchment at a variety of levels (Jackson and Sparks, 2005).

5.5 Conclusion

The analysis reported in this chapter has sought to document the major changes in the British grocery market since the start of the twenty-first century. Initially, it was established that against an unpredictable long-term macroeconomic backdrop, households have responded by reducing their expenditure and ultimately their grocery expenditure. Nevertheless, this has not been as

severe as it has been in other aspects of household budgets, most noticeably recreational activities. At the same time, it was shown that households have clearly not abandoned their ethical and moral beliefs on healthy foods for example. The outlook for stronger grocery inflation, and the potential prospect of reduced disposable income levels as the impact of the Government cutbacks come through, both loom large. Nevertheless, an assessment of the wider economy highlighted both the strength of the retail market and, in particular, the food sector (with the exception of independent retailers) in terms of employment and business survival. The recession in GB has clearly had an impact on consumer behaviour – shoppers are scrutinising their expenditure and ensuring they get best value for money by switching to different retailers. Tesco, for example, has struggled for the first time in years, losing market share to Sainsbury's, Morrisons, the discounters and Waitrose.

After analysing the wider changes to the retail landscape in the context of the national economy, new insights into the spatial pattern of grocery expenditure and retailer demand were also gleaned from analysing changes at the LAD level across GB in Section 5.3. In particular, the use of Vickers and Rees (2007) classification of districts also enhanced this understanding. It was found that both grocery expenditure and retail demand has a distinct spatial pattern beyond a regional level. The disaggregation down to LADs and use of Vickers and Rees (2007) classification revealed more varied patterns of provision and even areas that are underprovided given their population or spending power. The analysis highlights how the grocery market is highly complex at a subnational level, with considerable variation in provision suggesting that common references to saturation are overly simplistic – even for Tesco. With regard to ecommerce, it was reasoned that geography remains crucial in relation to food retail sales. However, whilst increased online grocery sales are expected, the market is constantly changing, making it difficult to predict what online grocery retailing will look like in the next few years.

A comprehensive analysis of recent supply-side changes also exemplified the extent of regional monopolies that exist in GB in terms of floorspace provision. Furthermore, despite new planning legislation and fears of saturation, retail growth will continue to occur: it is likely that the form rather than the extent of growth will change. For instance, the continued construction of large hypermarkets and the overwhelming increase in the number of convenience stores are pushing medium-sized supermarkets out of the market (not a recessionary trend). Moreover, as the varying levels of floorspace-per-household by the top retailers indicates, there may be sufficient demand in some under-provided markets (particularly in the South East), to support further expansion by grocery retailers, although this is of course dependent on the local availability of new sites which are subject to the 2008 CC assessment criteria (cited in Hughes *et al.*, 2009). In addition, in order to negate the impact of the increasingly competitive British

grocery retail market, many retailers are looking to expand overseas. However, as many other economies across the world have also suffered from the effects of recession and the documented failures by retailers in certain markets, retailers have to be far more knowledgeable in their international endeavours.

Even though this chapter has provided a comprehensive review, there is still a number of issues which require further exploration, and will thus be taken forward into subsequent chapters. For instance, whilst households have clearly been affected by the recession, have the changes been uniform across all consumer types (demographic, socioeconomic and geographic)? Furthermore, as competition for market share in GB intensifies between leading retailers - with a number of exits from the market already (e.g. Haldanes and Netto), the question remains whether the various supermarket chains and independent retailers can adapt to these market pressures in order to create new growth opportunities in GB?

Chapter 6

Household and Individual Level Trends in the British Grocery Market

6.1 Introduction

So far, the analysis in this thesis has been delivered primarily at an aggregate level. Whilst this has been important in unearthing general trends and insights into consumer behaviour across Great Britain (GB), it was established in both Chapters 2 and 3 that consumers promote quite different behaviour depending on their demographic, socioeconomic and geographic characteristics – especially during periods of economic hardship. Therefore, what is needed to supplement the more aggregate analysis is an evaluation of grocery trends at the household and individual level. In doing so, it will be possible to answer more detailed questions about trends in grocery expenditure and customer patronage in GB during times of recession. For example, over the course of the recession, to what extent is grocery expenditure being determined by household income, household size, family type, ethnicity, age and place of residence? Additionally, given the successes and failures of retailers in the grocery market, which consumers are altering their behaviour and ‘switching’ to different retailers? Therefore, what follows is an in-depth study of household behaviour in the British grocery market between 2005 and 2012. By making use of a survey previously unused in academic research, it is possible to study the patterns, disparities and determinants of consumer behaviour and their changes across time. Additionally, in order to provide a more local geographic analysis, the data provided will be for two comparative regions; Yorkshire and the Humber, and London.

Initially, Section 6.2 will begin by identifying the main patterns in household weekly expenditure across all areas of consumption. This will build on the analysis provided in Chapter 5, which exemplified aggregated figures for the national economy. Furthermore, it will help provide context for determining how households have altered (if at all) their grocery expenditure in comparison to the rest of the household budget. Section 6.3 will explain the estimation of levels of household expenditure and the harmonisation of categorical time-series data over time. This will enable an examination of how consumers, disaggregated by a range of

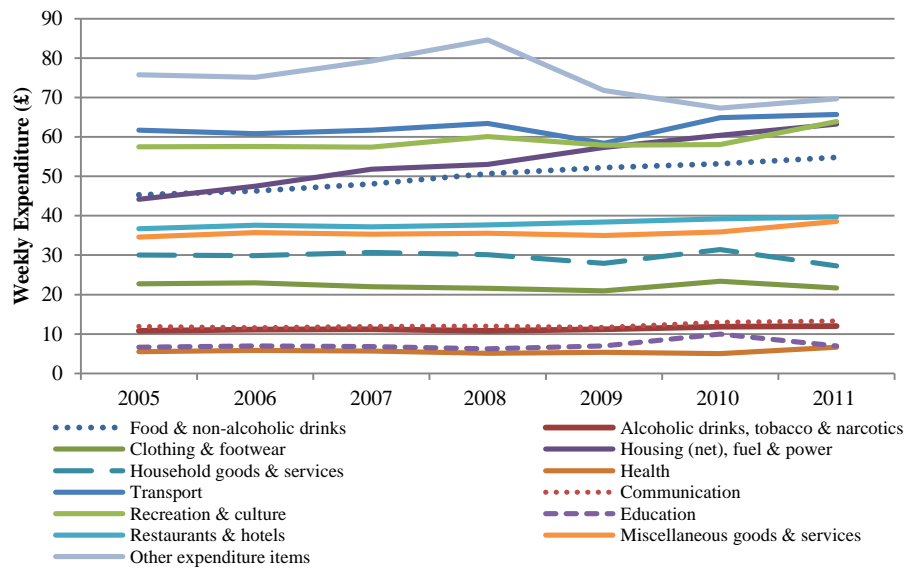
demographic, socioeconomic and geographic variables, have fared over the course of the recession. Section 6.4 will follow a very similar breakdown to Section 6.3, however; in this case the analysis will focus on customer patronage and the identification of ‘switching’ behaviour between retailers. In the penultimate section, some new insights are provided into the take-up and penetration of e-commerce as a viable channel in the grocery market. Once again, attention will be directed to the demographic, socioeconomic and geographic drivers at work. Finally, the main points and conclusions will be summarised in a concluding section which also identifies some unanswered questions to be explored in the remaining chapters.

6.2 Total Household Expenditure

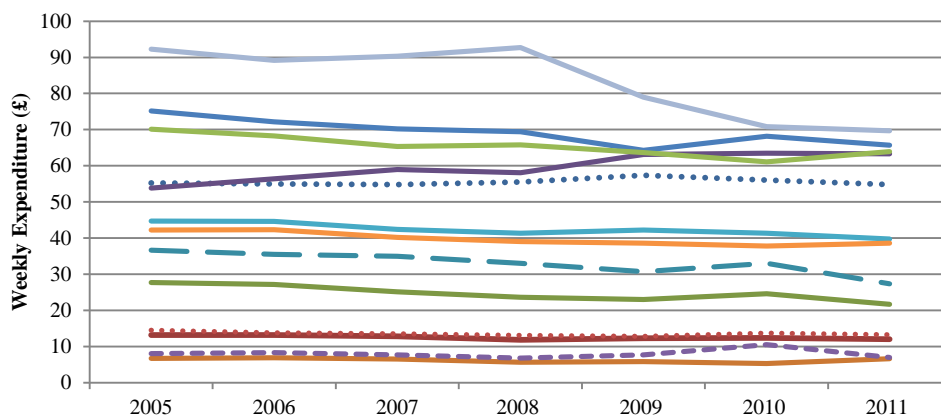
Whilst the national level analysis in Chapter 5 helped provide an insight into the impact of the recession on Gross Domestic Product (GDP) by expenditure categories and the overall state of the economy, the analysis in this section will concentrate on the trends associated with expenditure at the household level. Therefore, Figure 6.1 exemplifies total household expenditure broken down by the Classification of Individual Consumption Purpose (COICOP) over the period 2005 to 2011 from the Living Costs and Food (LCF) survey. Figure 6.1 illustrates expenditure both at current prices and constrained to account for inflation using the Retail Price Index (RPI). It is important to provide the distinction between these two different indicators due to the conflicting nature of the literature examining consumer expenditure since the recession identified in Chapter 2.

Initially, Figure 6.1(a) demonstrates that total weekly household expenditure has generally been on the rise between 2005 (£443.40) and 2011 (£483.60). However, expenditure did fall between 2007 (£471.00) and 2008 (£455.00) during the initial recession. This period was associated with extreme levels of uncertainty amongst consumers; therefore, it is of no surprise that households reduced their budgets accordingly. It is worth pointing out, however, that this period (2008-2009) was also a time of decreasing inflation, so goods and services will have been cheaper, driving down household costs. Looking specifically at certain areas of the household budget, ‘transport’ and ‘recreation and culture’ have consistently been the most expensive aspects of consumption. However, due to rising energy prices (see Chapter 2) it is clear that ‘housing (net), fuel & power’ has gradually become one of the most costly aspects of household consumption. Interestingly, expenditure on ‘food & non-alcoholic drinks’ has risen year-on-year since 2005. It is important to note that since 2009, groceries have been subject to rising inflation, putting pressure on consumers by driving up the cost of the weekly shopping basket. This is contrary to the majority of the other consumption categories which have remained relatively flat, and in fact

fell slightly in 2009. Expenditure on ‘other expenditure items’ has also fallen rapidly since 2009, arguably because non-essential items are being cut from the budget to save money.



(a) Current Prices



(b) 2011 Prices

Figure 6.1. Total household expenditure based on COICOP classification, 2005 to 2011

Sources: EFS (2005, 2006, 2007, 2008, 2009); LCF (2010, 2011)

Conversely, after factoring in the influence of inflation, which we know to have been fluctuating considerably since 2007 (see Chapter 5), Figure 6.1(b) exemplifies that average weekly expenditure was at its highest during the period in 2006 reaching £540.00, just before the ‘Credit Crunch’ hit. Total household expenditure, has since decreased by 10.4 per cent, falling to its lowest value of £483.60 in 2011. This is consistent with the Theory of Buyer Behaviour (TBB) which states that as the economic outlook weakens, consumers become more price

conscious and increase their price knowledge as they weigh price more heavily within their expenditure (Howard and Sheth, 1969; Estelami *et al.*, 2001).

In terms of individual areas of consumption, 'transport' has consistently remained the highest average weekly spend category throughout the time period. Spending levels were greatest towards the start of the time series, with households spending £75.20 per week in 2005 which subsequently fell every year until 2009 to reach a low of £64.30. In 2010, there was an increase in spending during the brief economic recovery before falling again to £65.70 in 2011. The categories with the greatest level of decline have been 'household goods & services' and 'clothing & footwear', both falling by 25.4 per cent and 21.7 per cent respectively. This demonstrates how households have had to prioritise their spending by revaluating their household budgets. Non-essential items such as appliances and clothing have clearly been hit hard, causing retailers such as Comet, Jessops and Woolworths to suffer greatly.

Interestingly, 'housing (net), fuel & power' is the only category that has seen an increase in spending since 2005. Its average weekly expenditure values have increased from £53.80 in 2005 to £63.30 in 2011. This is arguably a result of the increase in number of electrical items in the home pushing up energy usage as price increases have been factored into the analysis of Figure 6.1(b). Other areas of consumption have also remained relatively stable. For instance, expenditure on 'food & non-alcoholic drinks' has declined by only 0.7 per cent since 2005. The same can also be said for 'Health' as expenditure in this category declined only by 1.5 per cent between 2005 and 2011. This would be expected as both categories remain a necessity in any household budget. In 2005, weekly household expenditure on 'food & non-alcoholic drinks' stood at £55.20, rising to a high of £57.40 in 2009 (one of the only categories to rise during the recession) before declining again between 2010 and 2011 to the most recent figure of £54.80. The results are, therefore, in line with the notion that essential items such as food remain relatively stable against other categories during recession, as on the whole consumers continued their traditional food shopping behaviour (Bondy and Talwar, 2011), at least in terms of expenditure.

The various reductions and increases in spending across the different categories ultimately have a knock-on effect on the makeup of the household budget over time. As such, Figure 6.2 demonstrates the percentage of total household expenditure by COICOP classification between 2005 and 2011 (based on 2011 prices). The figures show that the proportion of household expenditure on 'other expenditure items' has fallen dramatically since 2005, along with spending on transport (now the highest), 'recreation & culture' and 'restaurant & hotels'. This readjustment of the household budget has meant that spending on 'food & non-alcoholic drinks'

has become a slightly larger proportion of the household budget (reversal of pre-recession trend, EEA, 2005). The issue still remains, however, whether or not this is the same for all household types and whether consumers are attempting to get more value for money for groceries, something which will be explored in the next section.

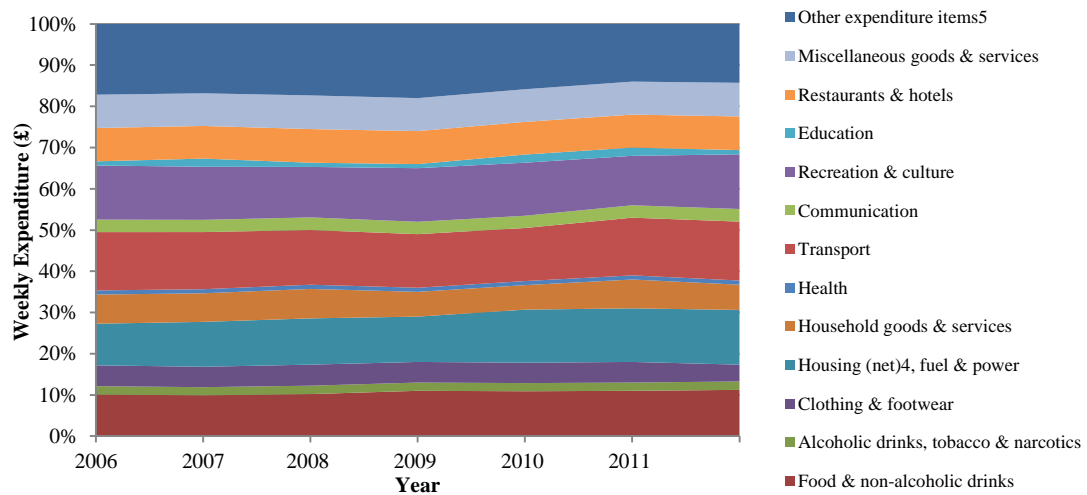


Figure 6.2. Percentage of total household expenditure by COICOP classification, 2005 to 2011, at 2011 prices

Sources: EFS (2005, 2006, 2007, 2008, 2009); LCF (2010, 2011)

6.3 Household Trends in Grocery Expenditure

The following section concentrates specifically on household expenditure on groceries between 2005 and 2012. Additionally, in order to expand upon the work in the previous section and Chapter 5, a micro level approach is adopted to provide more detailed insights into the behaviour of consumers during the recession. Specifically, grocery expenditure patterns will be broken down by various demographic, socioeconomic and geographic groups to identify those consumers that have been affected by the recession the most. The analysis provides an opportunity to update our understanding of household expenditure on groceries through survey data previously not accessible to academic research, Acxiom’s Research Opinion Poll (ROP) – in two comparison regions, Yorkshire and the Humber, and London.

6.3.1 Estimating Grocery Expenditure

Before any analysis can be carried out, a certain amount of estimation and manipulation needs to be carried out. More specifically, whilst the majority of data recorded through the ROP are gathered through a consistent approach, the categorical bands for the grocery expenditure variable were altered by Acxiom to include more detail for higher levels of weekly spend in

2008. Therefore, it makes it difficult to carry out consistent trend analysis using ROP data between 2005 and 2012. Additionally, given that the data are recorded categorically, it makes it impossible to bring the figures in line with rates of inflation, which is crucial given the price rises in food over the past few years (see Chapter 2). Therefore, what follows is a detailed description of the estimation process to harmonise the data across the time period, through the use of a nonlinear regression model. Initially, considerations will be given in a brief literature review to alternative data sources and comparable estimation techniques. Next, the selected methodology will be detailed in a step-by-step process before finishing with a discussion of the underlying trends from the model results.

Literature Review

As an alternative, it could be argued that the data from the Living Costs and Food (LCF) survey could be used as they have proved sufficient for the more national level analysis. However, given the nature of the small sampling size (6,500 households); these data would become too sparse when broken down into both regions (Yorkshire and the Humber and London) and different socioeconomic, demographic and geographic groups. Furthermore, the most recent LCF household data available at the time of analysis are for 2010 (takes two years to process), compared to the ROP which is available up to 2012. It is also worth noting that Output Area Classification (OAC) codes were not included in the LCF survey before 2009 and it contains no information on the actual retailer households shop with – pieces of information that will prove crucial to the construction of the Spatial Interaction Model (SIM) in Chapter 7.

As explained in Chapter 4, variable inconsistencies are not unique to the ROP, as many data sources such as censuses and social surveys include variables which have grouped data that are an aggregate of more detailed information which have changed over time (Norman *et al.*, 2012). Consequently, a range of curve estimation techniques are often used to provide more detailed figures. The terminology in this topic area is wide ranging, with ‘curve fitting’, ‘curve estimation’, ‘graduation’ and ‘smoothing’ being cited interchangeably (Benjamin and Pollard, 1980). However, in this case, the term nonlinear regression is appropriate because the models used express the relationship between two variables using a nonlinear function where parameters are estimated by a regression technique, minimizing the errors between predicted and observed values (Norman *et al.*, 2012). Whilst the main focus of the nonlinear regression is on the estimation of detailed information from grouped expenditure data by income, age and other household variables, the method outlined has also be applied in areas such as mortality (Congdon, 1993), fertility (Chandola *et al.*, 1999; Peristera and Kostaki, 2007) and migration (Norman *et al.*, 2012; Wilson, 2010).

In addition to nonlinear regression for curve fitting, other techniques also exist such as linear regression functions and relational models (Congdon, 1993; Norman *et al.*, 2012). However, nonlinear regression has an advantage over many of these techniques as it has the potential for substantive interpretability of parameters and the associated scope for comparison of curves over time and place (Congdon 1993). McNeil *et al.* (1977) also states that compared with nonlinear regression, change in the predicted curve direction can occur at the extremes of the data distribution when using linear regression (McNeil *et al.*, 1977). Additionally, given that the distributions of rates or counts across demographic and socioeconomic variables are often curved (e.g. concave, convex, exponential growth or decay, sigmoidal) nonlinear models have been proven to provide reasonable estimates of rates across the distribution in such situations (Norman *et al.*, 2012). Nevertheless, it is recognised that if the only aim of a curve fitting exercise is to obtain a good fit for the purposes of representation, then nonparametric graduation or other techniques may be preferred (Norman *et al.*, 2012). A full discussion of curve estimation techniques and their developments is beyond the scope of this chapter, so readers deciding on which approach to use for graduation and smoothing are directed to Keyfitz (1982), Kostaki and Panousis (2001), Peristera and Kostaki (2005), de Beer (2011) and Norman *et al.* (2012).

Methodology

In simple terms, the task is to estimate proportions for each unit (£) of the grouped grocery expenditure data, as it is known that underlying the grouped data there is a more detailed distribution. The detailed estimates may then be used to calculate average expenditure by selected socioeconomic, demographic or geographic groups or re-aggregated into consistent groups over time. The first step requires the banded data to be converted to proportions. These grouped proportions are then divided out into equal single units (£) within the grouped units (Table 6.1). For example, the 0 to £35 band proportions would be divided by 36, to get 36 equal proportions (one for each £ unit, including 0). The tail end (£150+) is dealt with by using the same number of units as the first band (i.e. £36) – making it £150 - £185.

Table 6.1. Grocery expenditure proportions by household income.

Grocery spend	Income						Total
	£0-9,000	£10-19,000	£20-29,000	£30-39,000	£40-49,000	£50,000+	
Up to £35	0.382	0.202	0.113	0.078	0.053	0.035	0.202
£36-£49	0.231	0.207	0.153	0.122	0.095	0.060	0.178
£50-£69	0.243	0.319	0.320	0.292	0.258	0.209	0.284
£70-£99	0.096	0.183	0.262	0.297	0.304	0.291	0.200
£100-£149	0.043	0.081	0.136	0.190	0.258	0.329	0.119
£150+	0.005	0.009	0.017	0.021	0.032	0.076	0.016
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: Acxiom Ltd (2010)

The next step involves selecting the correct curve to run the estimation from the available literature and an examination of the data. The literature suggests that the most relevant nonlinear regression curve for estimating grocery expenditure is one with a peak towards the lower end of the distribution, with a steeper ascent from the low end of the distribution up to the peak and a slower descent to the high end (Norman *et al.*, 2012). This is supported by Figure 6.3 which demonstrates the underlying distribution of weekly household grocery expenditure from the total expenditure proportions from Table 6.1 and national level weekly grocery expenditure data from the LCF (banded in £5 groups). It can be seen that both the ROP and LCF share an asymmetrical distribution, as Norman *et al.* (2012) denotes.

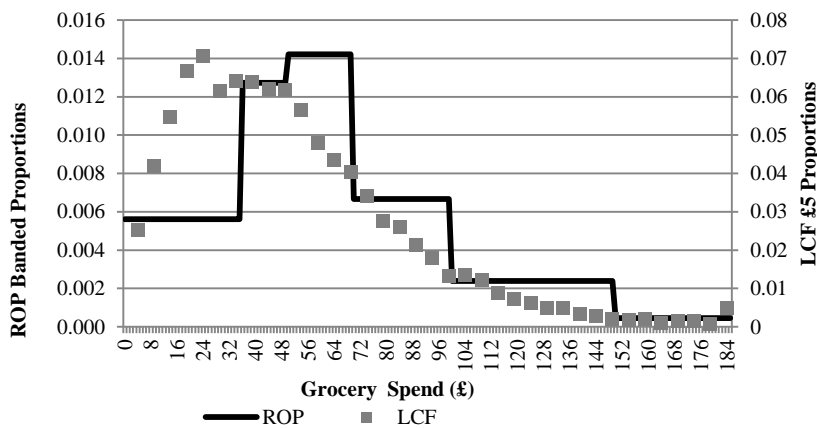


Figure 6.3. Total grocery expenditure proportions

Sources: Axiom Ltd (2010); LCF (2010)

Taking the above into consideration, Equation 6.1 was selected as the appropriate model. Initial exploration of this function found it to perform well, returning a realistic single-unit distribution compared to other methods such as the symmetrical model expression (see Norman *et al.*, 2012) and the cubic spline curve function. The equation is:

$$f(x) = (h \times \exp(r_d \times (x - p) - \exp(r_a \times (x - p)))) \tag{6.1}$$

where, $f(x)$ is the predicted model outcome, r_a is the rate of ascent (height of the curve), r_d is the rate of descent and p is the position on the x axis of the peak. In the context of the defined grocery expenditure model, equation 6.1 can be rearranged as follows:

$$f(s_k) = (h \times \exp(r_d \times (\hat{S}_k - p) - \exp(r_a \times (\hat{S}_k - p)))) \tag{6.2}$$

where, $f(s_k)$ is the predicted distribution of grocery expenditure by single £ for consumer type k (e.g. low income or consumers aged 18 to 24 years) and \hat{S}_k is the observed expenditure

distribution by single £, again disaggregated by consumer type k . The model parameters are estimated through an iterative process whereby an algorithm repeatedly adjusts the curve being fitted so that the sum of the squares of the errors is reduced at each step. It is invariably the case that a more complicated model will fit the data better (i.e. have a lower residual sum of squares) than a simpler one. However, parsimony of the number of parameters is generally preferred, as simple models are statistically more stable and offer a better basis for comparison over time and place (Congdon, 1993).

The model outputs the predicted distribution of the grocery data in proportions for single pounds. Initially, attempts were made to constrain the data back to the original groupings to improve accuracy but the unequal nature of the bands meant this was problematic (see Figure 4(a)). Consequently, in order to improve accuracy, the proportions were constrained back to the original groupings before rerunning the curve estimation a second time (on the constrained proportions). The model results were then finally constrained to the overall totals so that a smooth estimation was retained. This yielded noticeable improvements in the R^2 value between the observed and estimated data, although a third attempt made little change for the additional effort. So, to visualise, Figure 6.4(b) displays the modelled curves for three income types in 2010, a method which gives a good indication of how well the model represents the data (Norman *et al.*, 2012). It can be seen that the curve estimation retains the shape of the original data, with each of the income groups producing distinctive curves which reflect the amount of money being spent. For instance, the rise to the peak for the high income group starts later and the curve stays higher to the right than both the two lower income groups, supporting previous literature that households with lower incomes spend less on groceries than those with higher incomes (see Chapters 2 and 3).

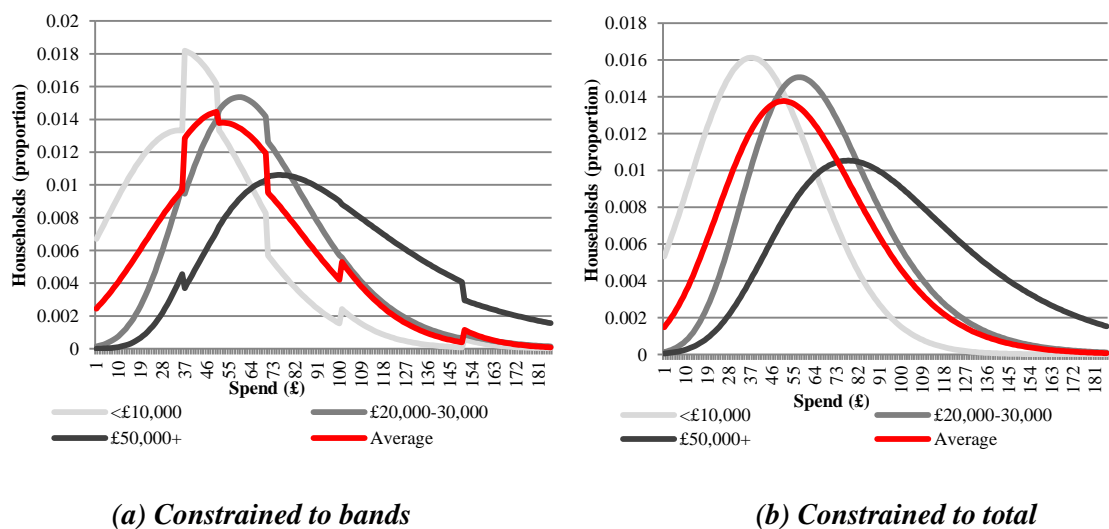


Figure 6.4. Modelled grocery spend curves by household income type
 Source: Acxiom Ltd (2010)

In addition, Figure 6.5 demonstrates the modelled and observed distributions of grocery expenditure by household income for the ROP for 2010 (survey bands). It is evident that the modelled results fit a very similar pattern to the original data, proving the worth of the estimation technique ($R^2 = 0.975$). However, it should be noted they do not perfectly align, illustrated through sum of squared error statistics between the modelled and observed distributions in Table 6.2. The red colours indicate that the lowest and highest spend category (tail-ends) produce the greatest error, an issue also raised by Norman *et al.* (2012).

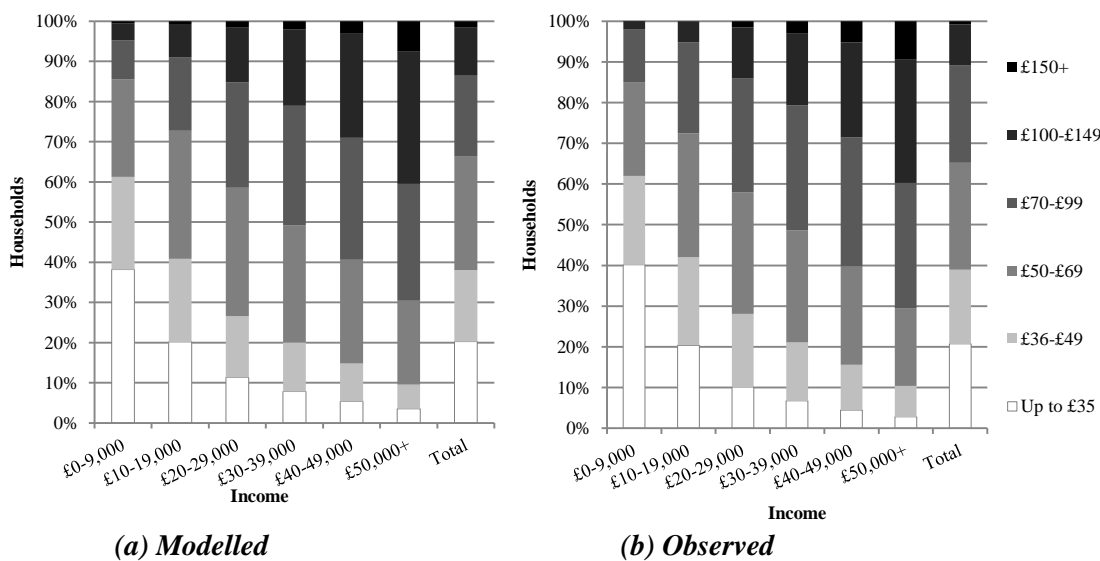


Figure 6.5. Modelled versus observed grocery expenditure by household income

Source: Acxiom Ltd (2010)

Table 6.3. Sum of squared error between modelled and observed expenditure proportions

Spend	Household Income						Total
	£0-9,000	£10-19,000	£20-29,000	£30-39,000	£40-49,000	£50,000+	
Up to £35	0.0004	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000
£36-£49	0.0002	0.0001	0.0007	0.0005	0.0003	0.0003	0.0000
£50-£69	0.0001	0.0002	0.0005	0.0003	0.0003	0.0003	0.0005
£70-£99	0.0011	0.0016	0.0003	0.0001	0.0002	0.0003	0.0016
£100-£149	0.0005	0.0009	0.0001	0.0001	0.0006	0.0007	0.0004
£150+	0.0000	0.0001	0.0000	0.0001	0.0004	0.0003	0.0001
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000000

Source: Acxiom Ltd (2010)

Household Grocery Expenditure

Finally, this entire process was then repeated for a variety of household types and for each ROP survey (15 in total) between 2005 and 2012 for both Yorkshire and the Humber and London. Theoretically, it would have been possible to produce estimates for endless household types; however, due to the level of processing involved, this would have been unmanageable.

Therefore, based on the literature and the logistic regression in Chapter 4, household size, age, gross annual income and OAC were selected. Cross-tabulations were then produced for these household types, a popular way of displaying time-series data over short periods of time (Olsen *et al.*, 2000). Moreover, rates of inflation (RPI) were also applied to grocery spend figures calculated from the modelled results so that realistic comparisons could be made across the time period. Figure 6.6 demonstrates the final estimates at 2011 prices along with the weighted figures produced from the LCF for GB from Figure 6.1(b). It is evident that the data follow a very similar trend which gives confidence not only to the ROP data but also to the non-linear regression estimation. The main benefit with the ROP data, however, is that due to the large sample size, these figures can be disaggregated by a variety of variables with more reliability than the LCF. Furthermore, it is also possible to analyse trends moving into 2012 as data from the LCF are only available for 2011 at the time of writing. It should be noted that the slight increase in expenditure recorded in the ROP is because the LCF spend data only includes expenditure on non-food items whereas the ROP covers the entire grocery shop.

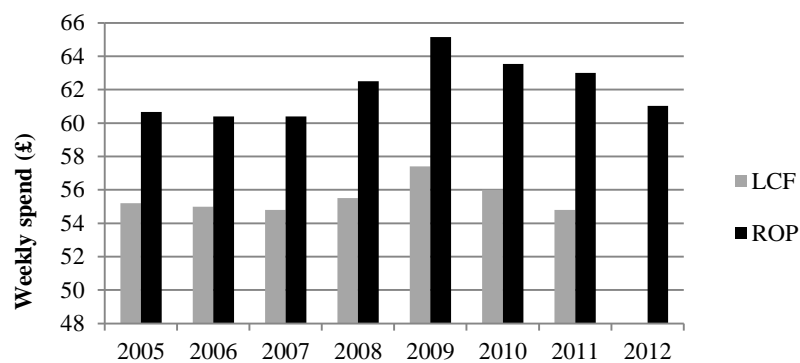


Figure 6.6. Weekly grocery expenditure in GB at 2011 prices, 2005 to 2012

Sources: EFS (2005- 2009); LCF (2010, 2011); Acxiom Ltd (2005-2012)

6.3.2 Age and Household Size

It was established from the literature reviews in Chapters 2 and 3, and the subsequent logistic regression analysis in Chapter 4, that certain demographic variables significantly influence consumer expenditure on groceries. Whilst there are a range of different characteristics that can be explored, age and household size are arguably two of the major determinants (Olsen *et al.*, 2000). Furthermore, it has been widely written that certain age groups have been affected more than others during the economic downturn (especially aged 18-29). Consequently, Table 6.3 exemplifies multivariate grocery expenditure estimates by household size and age of the Household Reference Person (HRP) for Yorkshire and the Humber and London between 2005 and 2012. It is possible to determine from the data how different households, depending on their

size (number of people living there) and the age of the HRP, have adjusted their expenditure through the recession, if at all. The values in the table have also been shaded blue (low), white (average) to red (high) to highlight the variations across the different combinations.

Initially, Table 6.3 illustrates that average grocery expenditure is higher in London than it is in Yorkshire and the Humber. This is both consistent with the literature (Poole *et al.*, 2002) and exploratory research by the Office for National Statistics (ONS, 2013). Furthermore, across the time period, the data demonstrate that prior to the initial onset of recession (2005 to 2008), grocery expenditure was on the rise in Yorkshire and the Humber although still remained relatively consistent. In comparison, average grocery expenditure declined year-on-year in London between 2005 and 2007 before rising in 2008. Similar to the national estimates in Figure 6.6, both regions recorded the highest level of weekly expenditure in 2009 before households reduced expenditure accordingly during the post-recession recovery (2010-2012). Interestingly, in Yorkshire and the Humber it would appear that households did increase their grocery expenditure in 2011 although this was only temporary.

Looking specifically at the different combinations in Table 6.3, a number of patterns are evident. It has already been highlighted in Chapter 4 how grocery expenditure varies by age and household size, so the discussion in this chapter will concentrate primarily on the changes over time. Nevertheless, when combining the two variables, the lowest levels of expenditure in both regions are found in households with only 1-2 people and where the HRP is aged 70+. In conjunction, the maximum levels of spend are associated with households with more than five people and where the HRP is aged 50-59. Interestingly, the maximum grocery spend figure of £102.04 is in Yorkshire and the Humber and not London. This would suggest that there is greater overall variation within the region as it too records the minimum value (£46.35).

Not all household types responded in the same way between 2005 and 2012. More specifically, households with 1-2 people demonstrate a relatively stable reaction to the changing economic climate. In both Yorkshire and the Humber and London, single person households and couples have only made minor adjustments to their spending. This could arguably be due to the greater disposable income in these household types – as there are less people in the household to buy food for. Alternatively, smaller households shop more often, topping up their shopping multiple times in a week. This top-up shopping reduces waste and arguably makes the overall weekly budget more stable. Nevertheless, within this group (1-2 people), the figures for Yorkshire and the Humber show that prior to 2007 (credit crunch), households with a HRP aged less than 50 were increasing their grocery spend whilst those with a HRP aged 50 and above were in fact reducing their expenditure. A similar trend is seen in London, although the 18-29 grouping

actually show a slight decline between 2005 and 2006. A possible explanation is the regularity that young single professionals were eating out in London prior to the recession (Warde and Martens, 2000). In comparison the larger households have made clear alterations to their grocery expenditure since 2005. Families have responded to the recession by generally increasing their expenditure during 2008 and 2009, whilst cutting back during the recovery in 2010-2011 (possibly a reason for the slow recovery?). Interestingly, it is the 70+ HRP group across all household sizes that show the greatest levels of change considering the recession has impacted young people heavily (Edwards and Irwin, 2010). Possible reasons could be the devastating impact on pensions which is squeezing their incomes, forcing many old people to re-evaluate their spending, even on essentials, such as food..

Table 6.34. Average weekly grocery expenditure by age and household size, 2005-2012

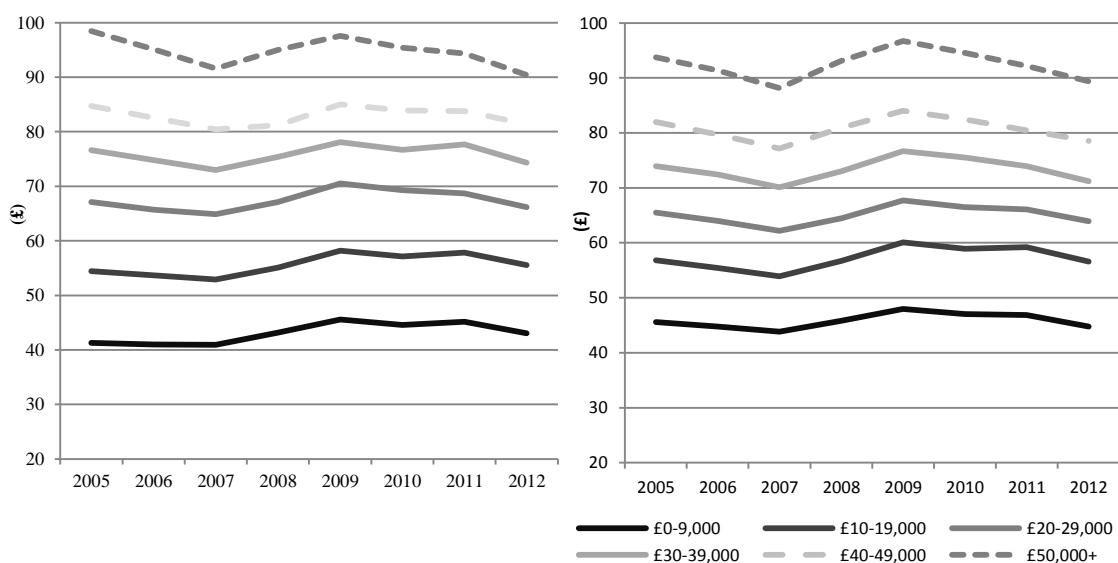
HH	Age	Yorkshire and the Humber (£)								London (£)							
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011	2012
1-2	18-29	53.52	54.15	54.25	54.62	55.92	55.04	56.30	55.63	53.88	53.37	52.13	54.60	56.45	55.48	54.00	52.42
1-2	30-39	62.40	65.80	69.06	70.23	72.92	71.32	69.95	68.01	64.70	66.11	66.74	69.98	72.64	70.41	67.41	64.98
1-2	40-49	64.38	67.77	70.69	71.21	74.00	72.59	72.39	70.17	69.33	72.45	74.17	75.90	78.43	75.87	70.75	67.86
1-2	50-59	57.88	57.61	57.17	58.93	61.99	60.97	62.26	60.06	65.96	64.76	63.48	64.93	67.62	65.97	62.57	59.47
1-2	60-69	51.35	50.90	50.43	53.06	56.46	55.67	57.83	55.89	58.68	57.64	56.39	59.71	63.16	61.94	61.21	58.53
1-2	70+	42.10	41.11	40.21	43.93	46.92	46.48	48.16	46.35	47.45	46.46	45.09	47.89	51.01	50.62	51.34	49.82
3-4	18-29	63.13	60.18	58.59	60.19	64.52	63.07	63.96	60.82	60.98	58.58	55.49	55.61	59.13	58.92	57.02	54.51
3-4	30-39	81.40	80.27	79.46	80.36	81.51	79.01	76.84	73.72	77.19	70.98	64.90	68.30	71.75	71.96	67.52	66.22
3-4	40-49	89.16	88.05	87.54	89.79	93.41	91.17	91.76	89.40	99.18	98.18	94.78	96.34	98.11	94.37	90.44	87.82
3-4	50-59	82.79	81.25	79.72	85.51	88.86	87.15	88.02	84.85	99.01	95.72	91.70	94.89	98.42	94.92	91.60	88.66
3-4	60-69	73.47	72.88	72.25	75.63	80.67	79.05	81.10	77.14	87.81	84.94	82.27	85.97	90.77	89.25	90.43	88.09
3-4	70+	63.73	62.49	60.34	69.57	74.88	72.81	75.48	72.27	73.71	70.48	65.29	73.31	79.21	78.64	80.15	76.83
5+	18-29	53.02	55.40	55.62	60.15	55.09	54.54	62.64	60.27	58.56	52.13	47.71	55.82	55.46	59.28	61.73	57.46
5+	30-39	99.85	87.24	84.83	77.80	81.23	65.33	84.93	82.87	80.80	73.01	68.03	70.71	65.04	66.99	65.17	60.39
5+	40-49	92.92	95.43	93.47	92.57	97.14	99.08	99.48	95.50	117.41	106.37	98.31	93.62	99.20	97.21	96.04	89.29
5+	50-59	99.09	95.90	93.67	96.13	103.27	103.18	104.36	102.04	115.20	106.12	98.70	103.61	108.86	106.55	101.70	94.85
5+	60-69	75.97	75.31	67.73	62.86	74.03	69.23	92.59	87.30	88.00	84.58	78.14	87.24	94.31	96.96	85.63	83.20
5+	70+	65.51	60.75	57.85	50.52	65.48	61.10	61.38	59.99	69.12	62.95	54.67	68.12	72.74	71.24	62.95	66.82
Total		57.17	57.50	58.40	59.27	62.53	61.08	61.77	59.75	64.14	63.30	62.38	65.73	67.76	66.00	64.25	62.30

Sources: Acxiom Ltd (2005-2012); RPI (2005-2012)

6.3.3 Household Income

In addition to age and household size, income is also one of the major determinants of household expenditure (Kohijoki, 2011). Therefore, it is appropriate to analyse how households in different income categories have adjusted their grocery expenditure since 2005. Furthermore, as income is not included on many household surveys (including the Census); the ROP data provides an important data source to examine the effect income has on the food budget in

British households. In the same way as the previous section, results are provided between 2005 and 2012 for Yorkshire and the Humber and London. Consistent with the logistic regression analysis in Chapter 4, the grocery spend estimates in Figure 6.7 highlight that expenditure increases with household income. Furthermore, as with the previous demographic estimates, this relationship remains stable over the time period which demonstrates that the non-linear regression methodology is able to produce robust results. Nevertheless, it is evident from observing Figure 6.7 that different households, depending on their gross annual income and the region in which they reside, adjusted their expenditure in varying degrees between 2005 and 2012. This variation helps demonstrate why some of the literature during this time has been so contradictory, for consumers have not all responded in the same manner.



(a) Yorkshire and the Humber

(b) London

Figure 6.7. Weekly grocery spend by gross household income at 2011 prices, 2005-2012

Sources: ROP (2005-2012); RPI (2005-2012)

Initially, between 2005 and 2007 in both regions, all households regardless of income were reducing their expenditure on groceries. However, in Yorkshire and the Humber, this reduction was more pronounced. More specifically, converting the figures into percentage increases illustrates that the greater the income of the household, the greater the reduction in expenditure (-0.69 per cent for '£0-9,000 and -3.8 per cent for '£50,000). Interestingly, in comparison, this relationship is less pronounced in London as households were more or less reacting correspondingly during this period. Moving into 2008 and 2009, Figure 6.7 exemplifies that in line with the general trend, all households in both regions increased their expenditure during the peak of the recession whilst reducing expenditure in other areas (Figure 6.1). It is worth noting however, that not all households responded equally. For instance, in 2008 and 2009, when GB was officially in recession, it was the lowest and highest earning households

(polarisation) that increased their grocery expenditure the most. This increase in expenditure was then followed by a reduction in spending in 2010, suggesting that consumers were reverting back to their pre-recession behaviour.

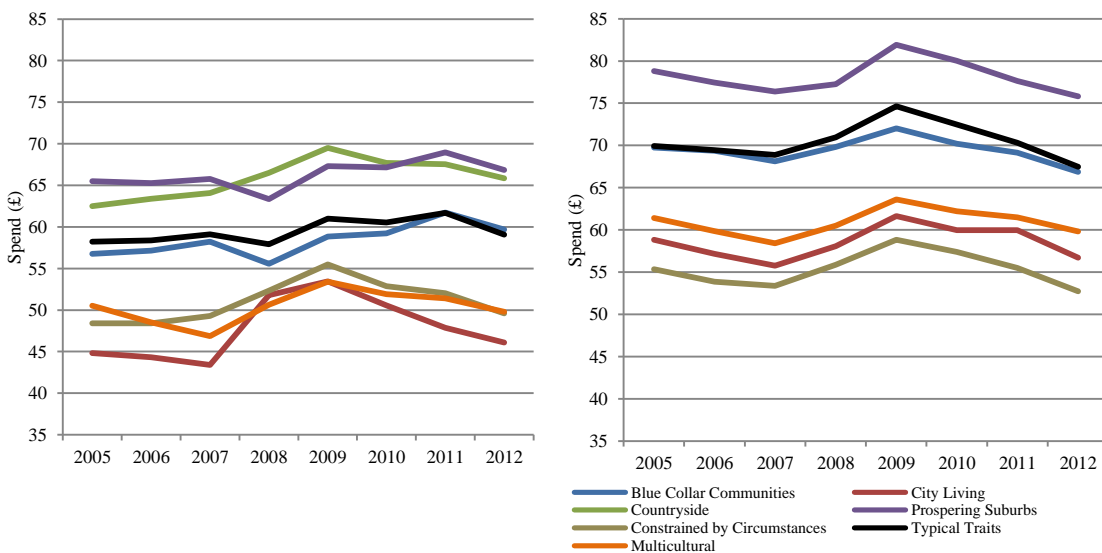
Nevertheless, this did not last long, as in 2011 certain households increased their grocery expenditure once more. In Yorkshire and the Humber, this was primarily those households earning £19,000 a year or less (1.3 per cent). In London, the trend was less defined as only those households earning £10,000-£19,000 a year increased their expenditure (although only marginally). Despite being a period of 'recovery', 2010 was also associated with increases in VAT (20 per cent) and harsh austerity measures from the Coalition Government that included a reform of the welfare budget. These impacts will have undoubtedly impacted heavily on some of the poorest households in the country, forcing them to adjust non-essential spending on eating out and increase expenditure on essential items such as food. Finally, between 2011 and 2012 expenditure on groceries fell once again in both regions as the overall trend reverted back to that seen prior to the recession. However, the relationship with household income in 2005-2007 had been reversed. More specifically, in 2012, the lower a consumer's household income, the greater the decline in weekly grocery expenditure. It could be argued that this was a result of the harsh austerity measures which were introduced in 2011 and which impacted most on many of the poorest households. Furthermore, 2012 was a particularly difficult and uncertain time in GB as a number of protests were being conducted. Moreover, in 2012, the economy fell back into recession for the second time (double-dip) as consumers clearly cut back more so than ever since 2005. It would appear that many households with low incomes (possibly relying on benefits) had no choice but to cut back their food budget. This behaviour is the complete opposite of that witnessed between 2008 and 2009. However, the increase in spending during this period may have only been a temporary reaction, as recessions can initially cause unpredictable behaviour and get off to a slow start (Pain and Weale, 2001).

6.3.4 Output Area Classification

The final household level analysis of grocery expenditure utilises the 2001 OAC. The OAC uses a combination of many socio-economic, demographic and geographic variables to classify neighbourhoods into clusters of areas and so makes a useful tool when analysing consumer behaviour (Vickers and Rees, 2007). It was still necessary to examine the other household types as geodemographic classifications can sometimes flatten out underlying variations. Moreover, household income was not available from the 2001 Census so makes an interesting and unique addition to the analysis. Figure 6.8 illustrates grocery expenditure by the top-level classification whilst Table 6.4 exemplifies the percentage change in grocery spend on the previous year for

the groups. As age, household size and wealth have already been examined in some detail, we will concentrate on the geographic aspects of consumer behaviour.

First of all, it is evident from the geographic aspect of the classification that there is more variation in Figure 6.8 than Figure 6.6 and 6.7. More specifically, whilst the ‘prospering suburbs’ supergroup spend the most on groceries, ‘blue collar communities’ spend the second highest in Yorkshire and the Humber compared to ‘typical traits’ in London. Moreover, ‘City living’ households spend the least in Yorkshire and the Humber, compared to the same consumers in London which actually spend more than the ‘constrained by circumstances’ households. This variation is interesting as it highlights the differences in the two regional markets. For example, Yorkshire and the Humber is a large geographic area in which some households will have a long way to travel to shop for food, especially since the growth of out-of-town developments (see Chapter 3). Consequently, consumers will shop less often but spend more to reduce the number of trips. This arguably explains the large difference in between the ‘countryside’ (removed from the London data due to small numbers) supergroup and the ‘city living’ (e.g. young professionals) consumers that eat out more and have less people to buy for (Olsen *et al.*, 2000). In conjunction, the demographic and geographic make-up of London is far different to Yorkshire and the Humber (greater variety of shops in London with increased food accessibility). This means that other factors such as income become more important in determining levels of expenditure (Warde and Martens, 2000; Olsen *et al.*, 2000).



(a) Yorkshire and the Humber

(b) London

Figure 6.8. Weekly grocery spend by OAC at 2011 prices, 2005-2012

Sources: Acxiom Ltd (2005-2012); RPI (2005-2012); Vickers and Rees (2007)

Table 6.4. Percentage change in household expenditure by OAC sub group in Yorkshire and the Humber and London, 2006-2012.

Sub Group	Code	Yorkshire and the Humber (%)							London (%)						
		2006	2007	2008	2009	2010	2011	2012	2006	2007	2008	2009	2010	2011	2012
Terraced Blue Collar	1a	0.08	1.03	3.10	5.22	-1.71	0.64	-2.75	0.20	-0.39	-0.57	1.97	-0.36	-3.49	-5.00
Younger Blue Collar	1b	0.19	1.87	-12.25	6.31	4.20	9.31	-4.53	-0.28	-0.93	1.24	6.89	-4.02	-2.42	-4.46
Older Blue Collar	1c	1.76	2.82	-4.61	6.22	-0.09	3.30	-2.81	-1.47	-3.97	6.78	0.82	-3.09	1.25	-0.57
Transient Communities	2a	-1.84	-1.92	22.36	4.56	-5.27	-11.20	-7.57	-2.98	-3.37	4.22	5.80	-1.68	-0.08	-6.06
Settled in the City	2b	-0.54	-2.11	16.92	2.04	-5.56	-0.23	-0.84	-2.73	-1.65	4.17	6.38	-3.60	0.09	-4.88
Village Life	3a	1.89	1.48	4.13	4.44	-2.66	0.14	-2.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Agricultural	3b	1.69	0.88	4.68	4.78	-3.10	-1.45	-1.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Accessible Countryside	3c	0.65	1.05	2.39	4.33	-1.89	0.63	-3.43	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prospering Younger Families	4a	-2.28	-0.64	-2.87	6.50	-0.40	1.68	-1.81	-3.58	-4.26	-2.80	5.83	0.82	-5.37	-2.15
Prospering Older Families	4b	0.84	1.22	1.48	5.97	-2.38	-0.46	-4.06	-1.81	-0.77	4.53	6.05	-3.71	-2.21	-2.21
Prospering Semis	4c	0.24	1.24	-8.69	5.85	2.02	6.11	-3.32	-0.37	1.42	1.50	5.67	-3.75	-1.61	-2.35
Thriving Suburbs	4d	0.17	1.46	-5.03	6.52	0.24	3.93	-3.07	-0.98	-1.42	1.49	6.48	-2.58	-2.58	-2.74
Senior Communities	5a	-0.27	2.02	8.25	6.00	-5.39	-2.20	-4.20	-3.73	0.86	10.03	9.39	-3.78	-10.41	-6.75
Older Workers	5b	0.47	1.98	5.87	5.53	-4.29	-2.39	-4.31	-1.48	-0.95	2.41	4.29	-2.46	3.75	-4.28
Public Housing	5c	-0.22	1.55	4.82	6.59	-4.56	-0.28	-5.38	-3.06	-2.34	2.97	2.95	-1.30	-4.52	-4.44
Settled Households	6a	-0.43	1.09	-2.05	5.30	-0.52	3.73	-4.41	0.04	-0.18	1.84	4.48	-2.66	-3.86	-2.42
Least Divergent	6b	0.51	1.68	4.70	5.49	-2.81	-0.71	-3.49	-0.57	-0.89	2.79	6.97	-2.59	-4.96	-3.31
Young Families in Terraced Homes	6c	-1.01	0.30	-0.06	5.24	-1.54	3.70	-3.41	-1.41	-1.02	4.59	4.67	-3.38	-0.49	-5.08
Aspiring Households	6d	1.74	1.81	-9.69	5.36	1.78	1.06	-5.60	-0.99	-1.23	3.01	4.67	-2.94	-2.51	-5.39
Asian Communities	7a	-2.53	-1.60	8.74	6.44	-3.73	-3.02	-3.57	-2.36	-2.53	3.07	5.52	-1.91	-0.86	-1.84
Afro-Caribbean	7b	-5.51	-5.43	7.23	4.39	-1.77	1.41	-2.64	-2.71	-2.27	4.06	4.72	-2.45	-1.55	-3.74

Sources: Axiom Ltd (2005-2012), RPI (2005-2012)

In the context of the recession and changes over time, the data in Figure 6.8 and Table 6.4 demonstrate some interesting findings across the two regions. First of all, between 2005 and 2007 in Yorkshire and the Humber, 'prospering suburbs', 'typical traits', 'blue collar communities' and 'constrained by circumstances' consumers remained relatively stable with regard to weekly grocery expenditure (general trend). However, 'countryside' households noticeably increased their grocery spend whilst the 'city living' and 'multicultural' groups were reducing theirs. This trend for 'countryside' consumers is in line with commentators that highlighted the pre-recessionary impact of out-of-town shopping centres becoming a one-stop shop for all items (ROP data includes all supermarket expenditure). Alternatively, the decline in expenditure within the 'city living' and 'multicultural' groups is harder to explain. In the context of wealth, the 'city living' group is far wealthier. The main commonality is that consumers in this group are found near the city centre. Consequently, they will be open to a wider variety of restaurants and takeaways to eat out more often (Warde and Martens, 2000; Olsen *et al.*, 2000). Prior to the recession, this was a growing trend amongst consumers who were living unconstrained by the threat of an economic downturn, (Jackson, 2005). It is worth noting that similar sorts of behaviour were also occurring in London at the time, the only difference being that the 'constrained by circumstances' group were actually reducing their expenditure.

In 2008 and 2009, the majority of consumers across both regions increased their expenditure in line with the national trend. However, there were one or two exceptions. In Yorkshire and the Humber, average expenditure declined for 'blue collar communities' and 'prospering suburbs' consumers in 2008, the latter actually falling below the 'countryside' group. Further investigation of the subgroups in Table 6.4 demonstrates this was primarily 'younger blue collar' (blue collar communities) and 'prospering semis' (prospering suburbs). Possible explanations could be the sudden rise in youth unemployment in 2008 (Edwards and Irwin (2010; ONS, 2012b), along with the prediction that the recession would hit the banking and service sector the hardest. In London, the only subgroups to show any kind of reduction in expenditure in 2008 were 'terraced blue collar' (blue collar communities) and 'prospering younger families' (prospering suburbs). Whilst these consumers are not directly comparable, they are both from the same groups as in Yorkshire and the Humber. Furthermore, the common theme is that younger and wealthier households reduced their expenditure during the start of the recession. There is also the influence of larger households (Table 6.3) having an impact which could also explain why 'Terraced blue collar' (London) and 'Prospering Semis' (Yorkshire and the Humber) reduced their expenditure. As with the other estimates, 2010 to 2012 was generally a period of decline with regard to grocery expenditure, especially in London. There was, however, some variation in Yorkshire and the Humber. For instance, the 'typical traits' and

'blue collar communities' groups maintained their expenditure through 2011 (low-middle income groups in Figure 6.7), only marginally reducing grocery spend in 2012. Furthermore, on examining the rates of change in Table 6.4, 'older blue collar' (blue collar communities) and 'older workers' (constrained by circumstances) were the only groups in London to reduce their expenditure – arguably a reaction to the threat to public sector pension reform in 2011.

6.3.5 Geographic Variations

In this final section regarding household trends in the grocery market, consideration is given to the underlying role of geography. It is known from the literature and previous analysis in this thesis that geography has an important influence on consumer behaviour (for instance Langston *et al.*, 1997; 1998). However, exploration of the physical spatial patterns of expenditure has been limited in the literature, especially in the context of the grocery market (primarily due data accessibility). Therefore, whilst the main aim of this chapter is to examine the changes across the recession, an up-to-date account of the spatial trends in grocery expenditure for the two case study regions will also be provided. Previously, in Chapter 5, attention was given to the underlying spatial patterns of grocery expenditure at the national level. Whilst this provided an important insight into the general spatial pattern across GB, it is known from the OAC analysis that there are much more detailed geographic variations at work (urban/rural).

Consequently, what follows is an exploration of grocery expenditure at a much smaller spatial scale. Figure 6.9 illustrates average weekly grocery expenditure in 2011, and the percentage change in average weekly expenditure between 2007 and 2011. In order to produce the figures, a number of steps had to be completed. First of all, the proportions of households in each 2001 OAC group were calculated for each MSOA in both regions. Technically, it would have been possible to calculate the rates from the ROP survey data. However, in order to remove the survey bias, 2001 Census proportions were used instead. Ideally, the new 2011 OAC would have been used but this product is still unavailable. Next, the figures were multiplied by the total number of households in each MSOA, producing the total number of households in each OAC group. Following on from this, it was then possible to multiply the number of households in each MSOA by the corresponding OAC group spend estimate for each year (Table 6.4), creating total weekly grocery spend per MSOA. For a similar methodology see Newing *et al.* (2013). In order to remove the effects of population change between 2007 and 2009, the 2007 household data were also used to calculate total spend in 2009 as well as 2007. The percentage increase in total expenditure for each MSOA was then calculated between 2007 and 2009 as if the population had remained static. This time period was also chosen as it reflects the peak of the recession (see Chapter 2) and represents a time when consumers were actively adjusting

their grocery expenditure. Finally, the total spend figure for 2011 was divided by the total number of households from the 2011 Census to calculate the average weekly grocery expenditure by MSOA in each region (Figure 6.9(a) and 6.9(b)).

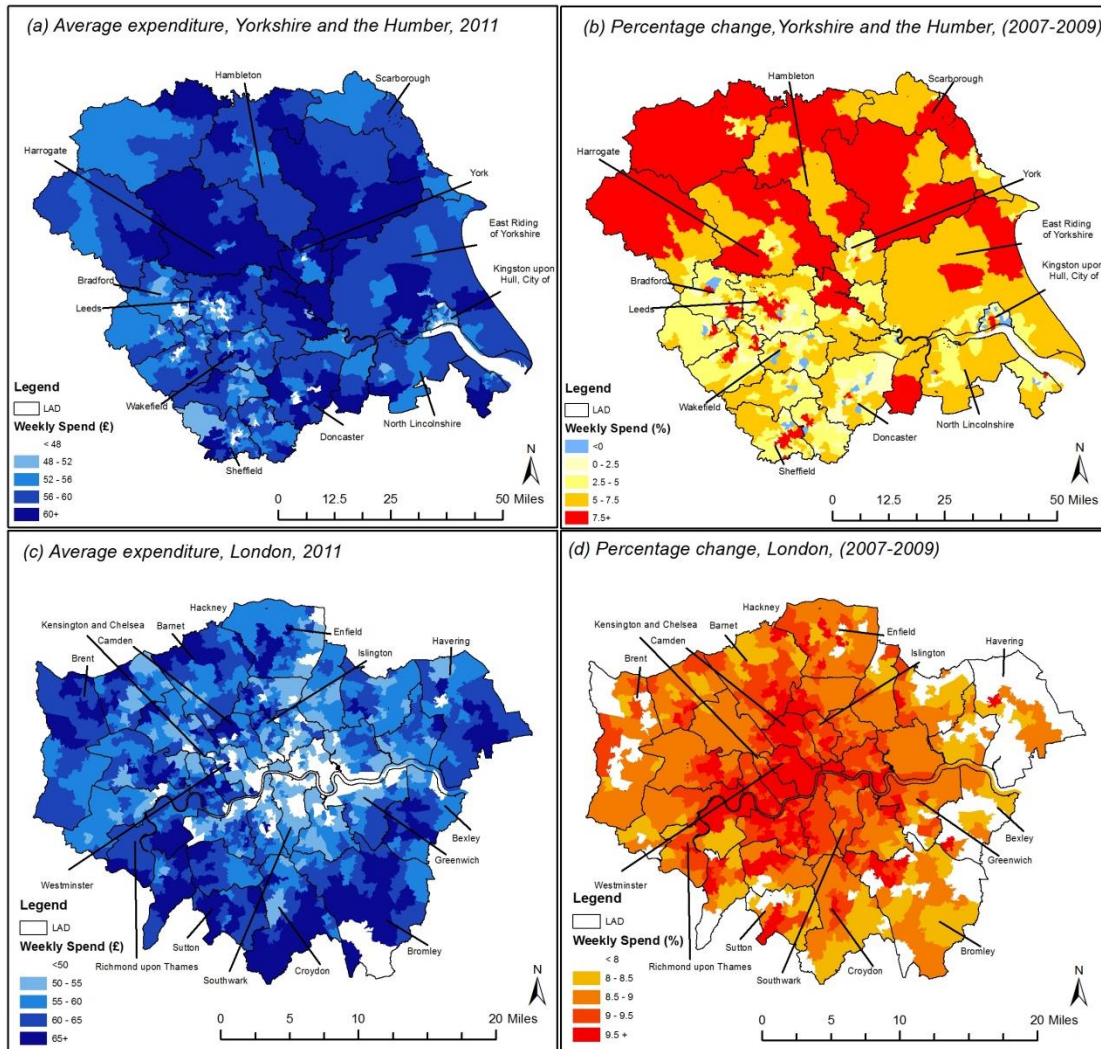


Figure 6.9. Grocery expenditure by MSOA, Yorkshire and the Humber and London
Sources: Axiom Ltd (2007, 2009); Census (2011)

There are definite underlying spatial patterns to the data shown in Figure 6.9. For example, Figure 6.9(a) and 6.9(c) exemplify average household grocery spend by MSOA for Yorkshire and the Humber and London. In both regions, it is clear that grocery spend is higher in the more rural parts of each region. Specifically, this includes Harrogate, Hambleton, York and the East Riding in Yorkshire and the Humber, and Sutton, Croydon, Barnet and Enfield in London. This pattern also extends to within the boundaries of many of the Local Authority Districts (LAD). For instance, in Yorkshire and the Humber, expenditure is much lower in the centres of Leeds, York, Sheffield, Wakefield and Hull, increasing only as you move further out of their centres. This internal LAD variation is not as localised as in the boroughs of London because the city is

so urbanised. However, it is highly visibly that average weekly spend is much lower in central London as shown in Figure 6.9(c). The spatial patterning is arguably because households living in city centres are served by more convenience stores (see Chapter 5), resulting in more top-up shopping and reduced weekly spend. Furthermore, due to the wealth of restaurants, pubs and takeaways in city centres, households living relatively centrally are likely to spend an increased proportion of their food budget out of the home. In comparison, consumers living further out of the city will be more likely to shop at larger supermarkets where they can purchase a range of products, including non-food items. Rising fuel costs may also put pressure on shoppers to buy in bulk so that they can make less frequent trips (increasing spend). In addition, from the previous analysis in this section, the patterns can also be explained by the underlying demographics and socioeconomics of the region's population. For instance, in city centres and central London there are more single person households occupied by young people – both of which relate to reduced spend. Additionally, in Yorkshire and the Humber, rural areas with high spend such as North Leeds, Harrogate, west of Hull and the areas surrounding York, are associated with and wealthy neighbourhoods – another factor highly correlated with increased spend.

In conjunction, Figure 6.9(b) and 6.9(d) provide a geographic insight into the grocery spend changes that occurred between 2007 and 2009. First of all, it is evident that spend increased across the majority of areas in both regions. This is to be expected given that average grocery expenditure increased in GB during this period (Figure 6.1). Nevertheless, there are some suburbs on the outer parts of towns and cities in Yorkshire and the Humber where average expenditure actually declined (Hull, Bradford and Doncaster). This is arguably a result of the reduction in grocery spend in 2008 by younger households ('younger blue Collar' and 'prospering younger families'), middle earners ('settled households' and 'older blue collar') and slightly wealthier households ('prospering semis' and 'aspiring households'). In contrast, the areas with the greatest increases are slightly more mixed in the region. For instance, average grocery expenditure increased greatly in some of the more rural parts of North Yorkshire and also the inner city areas of Leeds, Hull and Sheffield. In London, there is a much more distinct pattern, with the greatest level of increase contained to the city centre. Moreover, it is also worth noting that expenditure increased across the whole city between 2007 and 2009 (when controlling for population change).

6.4 Household Trends in Customer Patronage

In studying changes in household expenditure over the course of the recession, it has been possible to identify how certain households (varying by demographic, socioeconomic and geographic indicators) have adjusted their expenditure on groceries. Furthermore, by using a

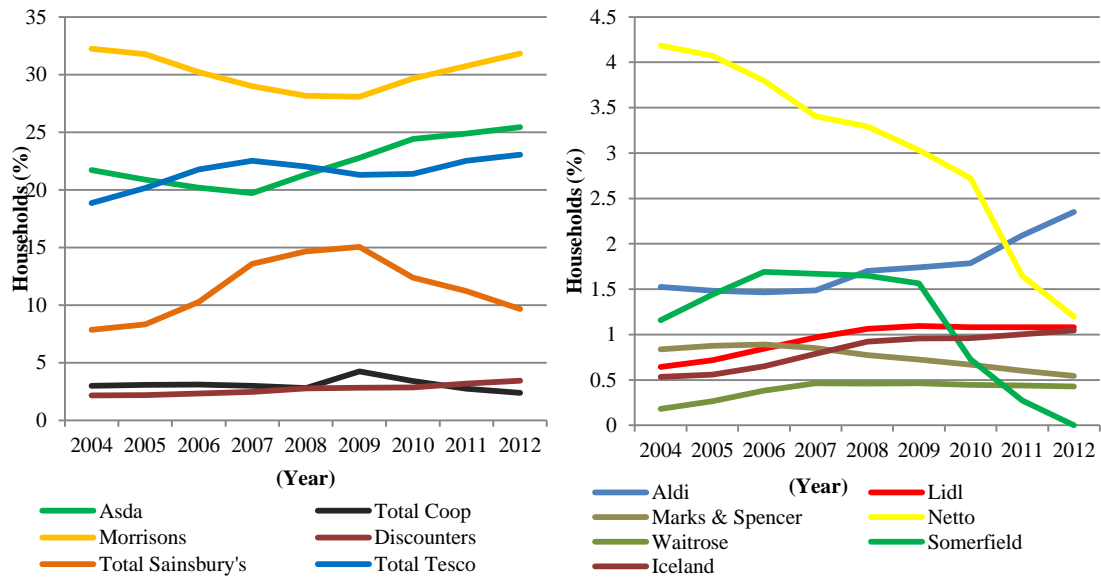
combination of the most recent ROP survey data and 2011 Census data, the thesis has been able to provide an up-to-date account of the geographic relationship associated with household expenditure. However, one aspect of TBB which was not possible to understand through the analysis is whether or not brand preferences changed as well? This ‘switching’ behaviour is especially pertinent within the grocery sector, as consumers do not have the option to hold-off purchases and must get the best value possible during a recession (Bondy and Talwar, 2011). It has already been established that a certain level of ‘switching’ behaviour has occurred at a national level since 2007/08 as households were seen to be trading up and down, polarising the market (see Chapter 5). However, what is not yet known is whether this trend is representative across multiple regions and for all household types.

6.4.1 Market Share

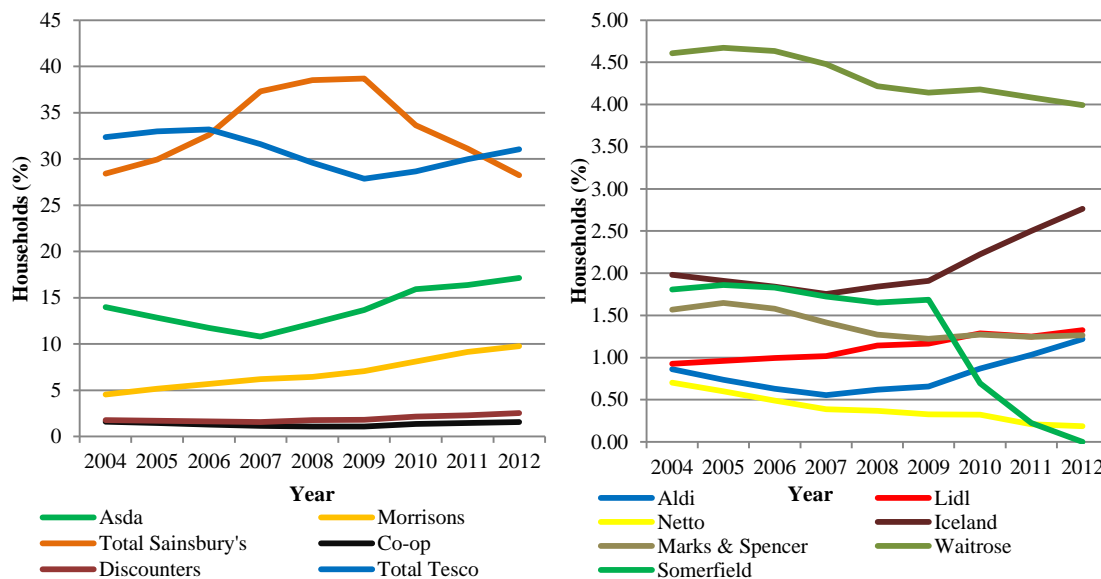
On account of the regional variations in demand that were highlighted for selected grocery retailers in Chapter 5, it is important to first discuss the regional ‘market shares’ for the two study areas prior to the more detailed consumer analysis. As such, Figure 6.10 represents the percentage of households (from the ROP) that use each of the selected retailers for their main grocery shop in Yorkshire and the Humber and London. The graphs include both the main retailers and those with more modest market shares so to provide a more holistic representation of the grocery sector. Unfortunately, it is not possible to highlight the fortunes of the smaller independent retailers as in previous chapters. Additionally, it should be noted that whilst the figures demonstrate a good indication of market share, the data do not take into account the variation in spend that is likely to occur. For instance, it is likely that households will spend more when shopping with premium brands such as Waitrose than in a discount store like Aldi or Lidl. Nevertheless, the ROP data do provide a good indication into the level of ‘switching behaviour’ and brand loyalty throughout the economic downturn (Thompson *et al.*, 2010a).

Figure 6.10(a) illustrates that Morrisons is the most dominant retailer (in terms of total consumers) in Yorkshire and the Humber, followed by Asda and Tesco. This is to be expected given the number of stores and increased levels of floor space that these retailers have in the region (see Chapter 5). Alternatively, from the ‘big four’, the lowest levels of demand can be associated with Sainsbury’s, followed by smaller retailers such as Waitrose, Iceland and Marks and Spencer. Further investigation of the data reveals that demand has not remained static between 2004 and 2012. More specifically, the percentage of households shopping at Morrisons was falling between 2004 and 2009. In 2010, this trend was then reversed as the number of consumers shopping at Morrisons increased. A similar pattern emerges for Asda, although the change occurred earlier in 2007/2008. This could be an indication that since the ‘Credit Crunch’

and subsequent recession, consumers in Yorkshire and the Humber reverted back to trusted and familiar brands.



(a) Yorkshire and the Humber



(b) London

Figure 6.10. Percentage of households that use selected retailers as for their main grocery shop, 2004 – 2012..

Sources: Acxiom Ltd (2004-2012)

In comparison, Tesco and Sainsbury's performance has been mixed. Between 2004 and 2007, both recorded levels of growth. However, since then, the level of demand for Tesco has undulated and after an initial rise in 2008, Sainsbury's has struggled (similar to national picture). Outside of the top four, in-line with the national trends seen in Chapter 5, Waitrose,

Aldi, Lidl and Iceland have recorded strong growth levels, specifically since 2008 and 2009. Whilst this is largely due to increased stores in the area, the growth would suggest a polarisation in the market as consumers trade-up and trade-down (see Chapter 5). Nevertheless, it would seem that this success was not shared with low-budget retailer Netto, as Figure 6.10(a) exemplifies how demand for Netto has steadily been on the decline since 2004 – long before the takeover by Asda in 2011. Interestingly, the Co-op have had varying degrees of success since the takeover of Somerfield in 2007 (many stores of which were in Yorkshire and the Humber). After an expected rise in new customers in 2009 and 2010, the percentage of households shopping then declines. Thompson (2012) accredits this poor performance to a trading crisis in the Co-operative Group's food division, caused by the Somerfield stores that it acquired nearly three years previously.

As one might expect, the demand for the selected retailers in London is somewhat different, primarily due to the regional variations in store networks identified in Chapter 5. Figure 6.10(b) indicates that the majority of households shop at Tesco and Sainsbury's, followed by Asda and Morrisons, with Netto and Aldi recording the lowest shares. There are, however, some similarities to Yorkshire and the Humber such as the behaviour for consumers shopping at Sainsbury's. More specifically, Sainsbury's was attracting new consumers prior to the recession, arguably due to the rapid expansion plans across the country. As the economy began to struggle between 2007 and 2009, growth slowed but the retailer was still seeing increases in demand. It is believed that during this period, consumers started to place growing importance again on fresh and quality foods, boosting not only Sainsbury's but Morrisons sales. It is worth noting, however, that Figure 6.10(b) exemplifies a period of constant growth for Morrisons in London – so the company's success in the capital is unlikely to be directly linked to the recession. Since 2010, it would appear as though Sainsbury's has struggled, losing ground to the rest of the big four. Interestingly, during the peak of the recession, Tesco and Asda both recovered after seeing a decline in demand prior to 2008/2009. This is contrary to certain national data which have shown Tesco struggling since the recession, as it has been forced into middle ground. Furthermore, it is interesting that Asda and Morrisons, two typically northern brands, have been succeeding during such a harsh economic climate. Possible reasons could be that even in London where average income is higher, households are attempting to get more for their money by leaving Sainsbury's and shopping at more price sensitive retailers such as Asda and Morrisons (Howard and Sheth, 1969). This is also reflected in the decline of Waitrose, who nationally have been championed as a major success story. These trends are also in contrast to Yorkshire and the Humber in the sense that consumers are not reverting to trusted regional brands (Sainsbury's and Waitrose). This is arguably because consumers are far more

desensitised by brand in London, on account of the intense competition and the diverse composition of the population (see Chapter 4).

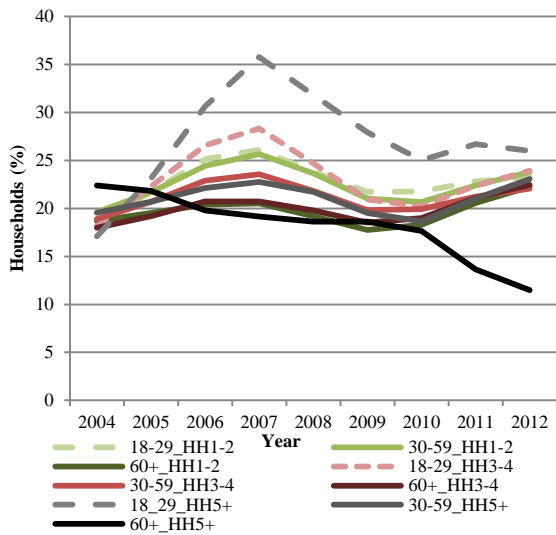
6.4.2 Age and Household Size

As in Section 6.3.2, HRP age and household size will be used to determine the demographic variations in consumer behaviour for Yorkshire and the Humber and London. However, in this instance, consumer behaviour will be in the context of brand preference in the British grocery market. Figure 6.11 and 6.12 demonstrate the percentage of households that shop at each retailer disaggregated by the age of the HRP and the household size. The percentages were calculated as shares of the market rather than internal to each retailer so that the long-term demographic trends (population increases, population ageing and rise in single person households) previously discussed could be controlled for (Birkin *et al.*, 2002; ONS, 2012c).

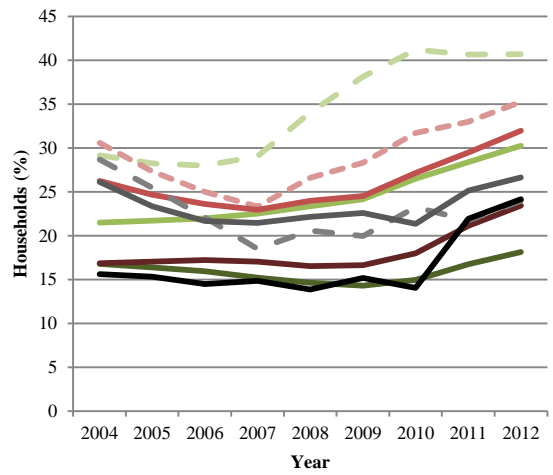
The results from Figure 6.11 show distinct demographic variations in both the composition and behaviour of households between 2004 and 2012. Initially, in Yorkshire and the Humber, it is evident that Tesco is more popular with younger households, especially, with large families (18-29_5+). A possible reason is the range in formats that this 'time conscious' consumer can exploit (Wilson-Jeanselme and Reynolds, 2005). Between 2004 and 2008, Tesco was increasing its share of this demographic group; as the performance of the company declined during the recession, so did their main customer base. However, there has been a slight recovery since 2010. Interestingly, it would appear that Tesco is not a popular choice for older families, as the '60+_HH5+' group displays the lowest proportions. Moreover, this consumer group has been leaving Tesco steadily since 2004, a trend which was amplified in 2009/10 by the harsh economic environment. In comparison, Figure 6.11(b) exemplifies that Asda has a similar composition to Tesco in that it is favoured by younger, smaller households. However, since 2007/08, Asda has managed to attract increased levels of this consumer group (at the expense of Tesco) which is recognised for exhibiting a higher seeking behaviour of different stores (Martinez-Caraballo and Burt, 2011). Next, it is clear the Sainsbury's consumer base is much different to those of Asda and Tesco. Households with an older HRP are more likely to shop at Sainsbury's, whilst younger single households are the least likely. On account of the ageing population in GB, Sainsbury's will be well placed moving forward as the elderly become a major force in the grocery market (Birkin *et al.*, 2002). Nevertheless, the retailer will have to prevent the current slump in demand, which seems to be affecting all demographic groups in a similar manner. Morrisons, the last of the big four retailers has a similar consumer profile to that of Sainsbury's in that it has a greater share of older households (Figure 6.11(d)). Prior to 2007, consumers across all the demographic groups were leaving to shop at other retailers. However,

since 2007/08, households with an HRP aged 60+ have started to come back, helping to lift the retailer's market share once more. Interestingly, the younger consumers (18-29 years) have continued their pre-recession behaviour, causing a decline in Morrisons market share of this demographic. Therefore, it is in fact the older consumers that place more impetus on brand that have helped lift Morrisons market share (Kohijoki, 2011).

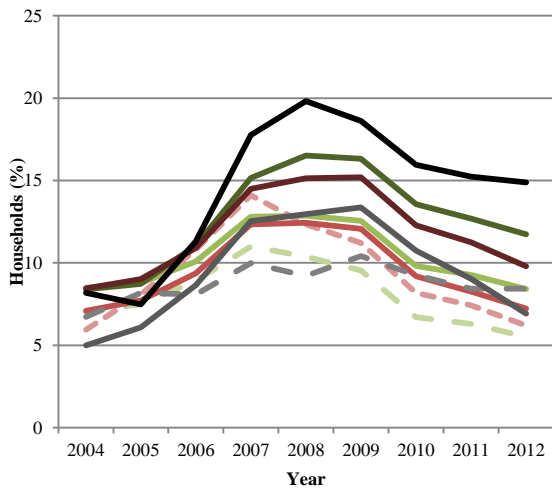
The final two graphs display markets share across each of the demographic groupings for the discounters (Aldi and Lidl) and Waitrose. Despite the contrasting nature of these retailers, both have witnessed record levels of growth since the recession began. Before 2008, it was mainly older households and large families that were shopping at the discounters. This is not surprising considering the low costs associated with their products. However, since 2008/09, Figure 6.11(e) exemplifies accelerated growth in the market share of younger customers as the recession amplified the already visible trend. Moreover, it would appear that these consumers are not from one specific retailer, 'switching' from both Sainsbury's and Morrisons. Young people in GB have been one of the worst affected by the recession and therefore it is of little surprise many (especially those with families) have traded down to the discounters. Additionally, it further supports the notion that younger consumers are more price sensitive and often prefer cost savings over brand loyalty (Wilson-Jeanselme and Reynolds, 2005; Kohijoki, 2011). In comparison, Waitrose has a strong attraction for older households (high importance on local products), whilst household size appears to show no real relationship. In terms of growth, the recent introduction of new stores in the region has clearly benefited the retailer, increasing their market share across all demographic groups. Nevertheless, it could be argued that since 2007, many large families with an HRP above 60+ years have 'switched' back to Morrisons and Asda.



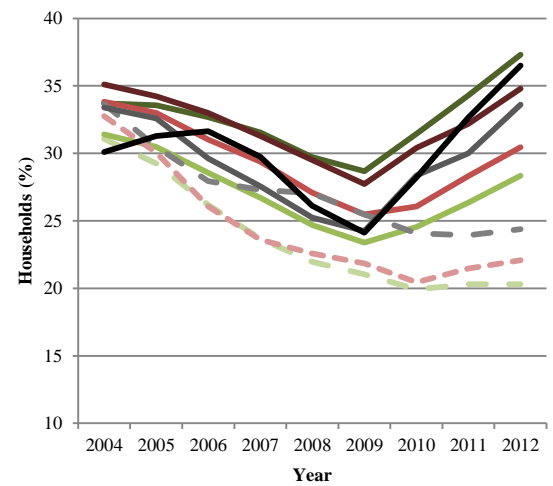
(a) Tesco



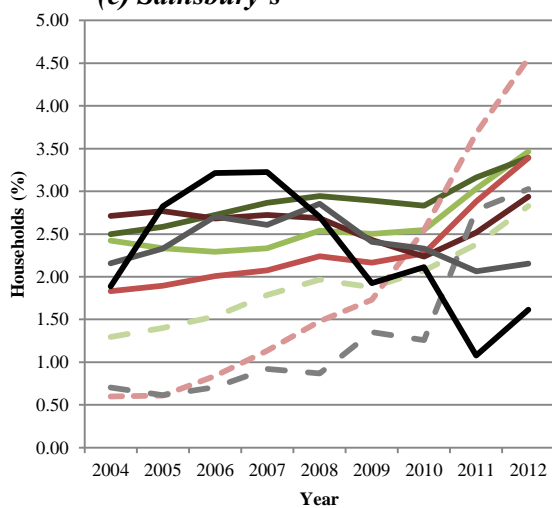
(b) Asda



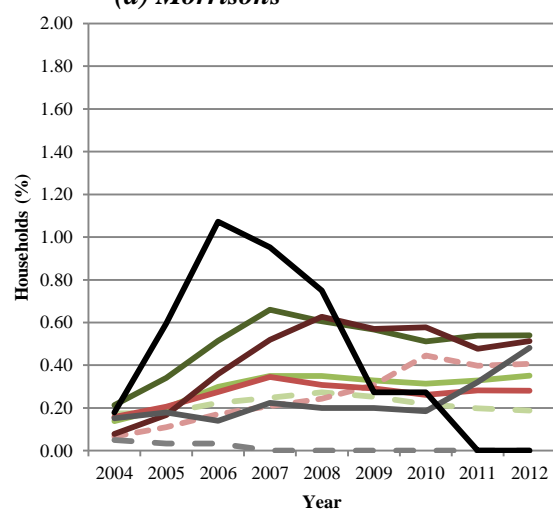
(c) Sainsbury's



(d) Morrisons



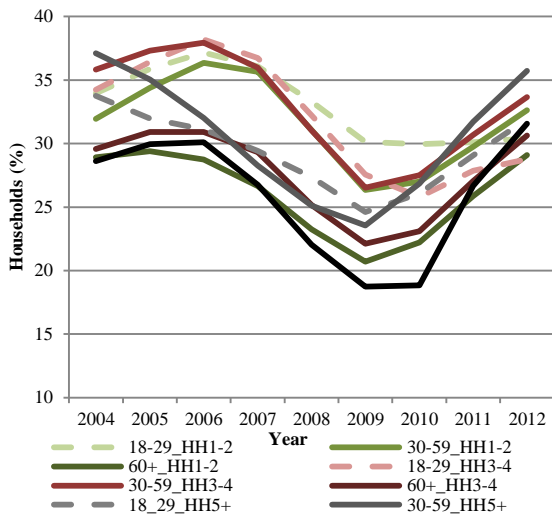
(e) Aldi and Lidl



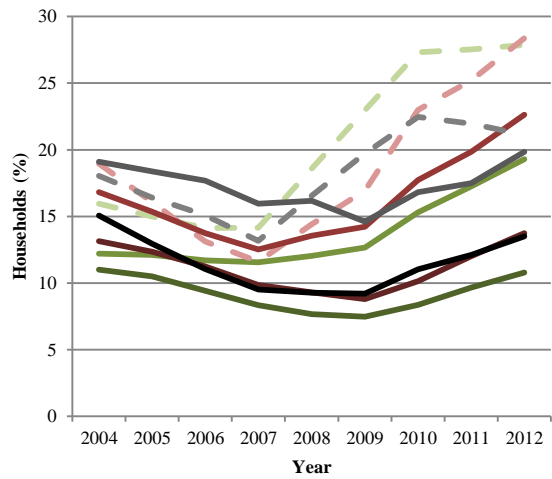
(d) Waitrose

Figure 6.11. Customer patronage by HRP age and household size, Yorkshire and the Humber, 2004-2012

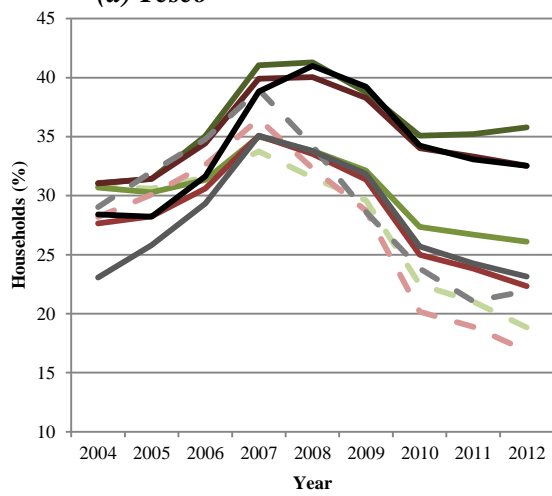
Sources: Acxiom Ltd (2005-2012)



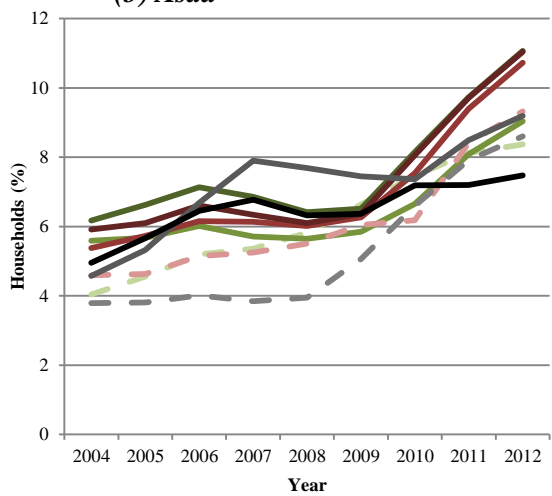
(a) Tesco



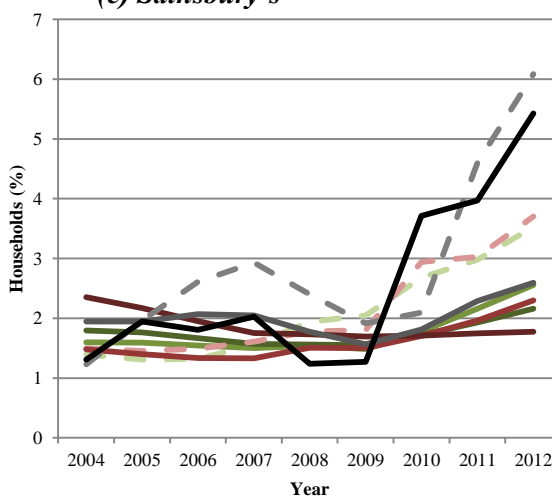
(b) Asda



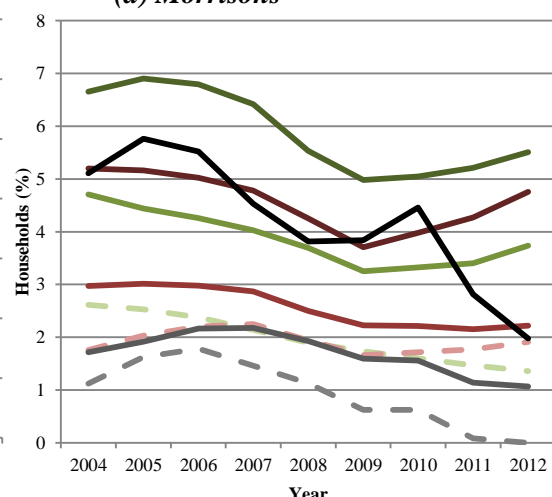
(c) Sainsbury's



(d) Morrisons



(e) Aldi and Lidl



(d) Waitrose

Figure 6.12. Customer patronage by HRP age and household size, London, 2004-2012
 Sources: Axiom Ltd (2004-2012)

Figure 6.12 provides an insight into customer patronage by the same demographic indicators but for London. Whilst there are some similarities between the respective brands in both regions, there are also some distinct differences in the composition of their consumers. For instance, as shown in Figure 6.12(a), Tesco appears to be popular amongst younger households in London. However, since 2008/09, there has been a visible increase in the number of families (3-4 people households) shopping at Tesco. This shift in behaviour is contrary to the view of some commentators that London was unaffected by the recession as consumers continued to behave as they previously would have. This is further supported by Figure 6.12(b) which exemplifies increased levels of younger households of all sizes 'switching' to Asda since 2007/08 – similar behaviour to Yorkshire and the Humber. Conversely, Asda still struggles to attract older customers as the retailer places less importance on local produce – something which is believed to be important to this demographic (Goodwin and McElwee, 1999; Whelan *et al.*, 2002). The influx in younger consumers at Asda has been at the expense of Sainsbury's, who has struggled to keep hold of younger families since the 'Credit Crunch' hit GB in 2007/08 – raising the point that younger shoppers react quicker to market changes although it should be noted that Sainsbury's core demographic has traditionally been households with an older HRP, who have remained relatively faithful whilst others have not since 2009/2010. As previously stated, Morrisons has steadily been growing in the capital since 2004 with the recent introduction of new stores. Unlike many of the other retailers, the company appears less reliant on a core demographic. Nevertheless, since 2008/09, there has been a noticeable rise in the percentage of families (3-4 people households). This is arguably because Morrisons offers a more cost effective alternative for families to the likes of Tesco and Sainsbury's in London.

Similar to Yorkshire and the Humber, the expansion of store networks by Aldi and Lidl has collectively increased the market share for the discounters in London. Prior to 2008/09, their customer base was somewhat mixed – as result perhaps of all consumer types sampling the new retailers in the area. However, since 2008/09, as in Yorkshire and the Humber, the discounters have carved out a strong market share amongst younger households, especially, with large families. This is contrary to some research which has found that large households have a tendency to exhibit loyal behaviour, since their family commitments and time restrictions are greater (Mägi, 2003). Interestingly, there has also been a rapid rise in larger, older households. This trading down of larger older families could arguably be households with older children at university responding to the announcement of increasing fees for 2012. Finally, whilst increasing market share on a national scale, Waitrose appears to have suffered in London. Since 2008/09, Waitrose has been losing many of its younger and larger households to its competitors. However, there has been a slight increase in the middle aged band (30-59 years) and middle sized families. These demographic groups are likely to have more disposable income than the

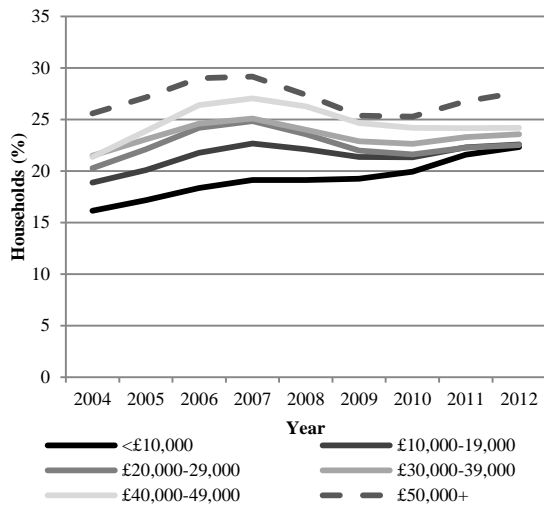
larger younger/older households and are perhaps the consumer mentioned in the literature repositioning their food budget to eat out less and spend more in premium grocery stores.

6.4.3 Household Income

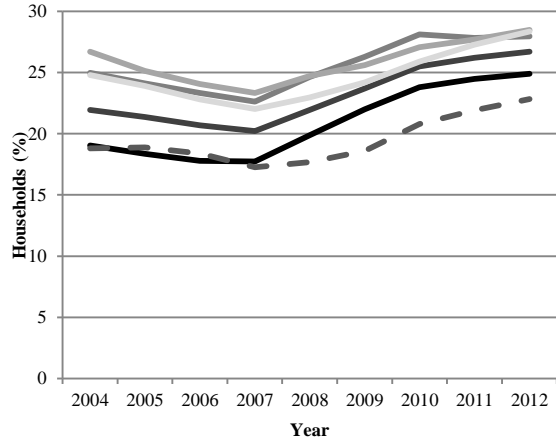
To provide further understanding of the behaviour of consumers in the grocery market, Figure 6.13 and 6.14 highlight the brand choices made by different households by gross annual income for Yorkshire and the Humber, and London respectively. To ensure consistency, customer profiles are provided for the top four retailers, the discounters and Waitrose. Similarly, to the analysis in Section 6.3.3 that revealed grocery expenditure to differ by income, initial exploration of the data exemplifies that household income has a direct effect on brand choice in the grocery market.

Since 2004, In Yorkshire and the Humber, Tesco have remained more popular with consumers that have the higher annual incomes. Although, this relationship has become less distinct since 2008/09 as the retailer has attracted more consumers with lower incomes. Next, the data highlight the somewhat mixed profile for Asda in Figure 6.13(b). It would seem that Asda are more popular with the middle earning households as demand is lowest amongst the '<£10,000' and '£50,000+' groups. Again, Morrisons have a somewhat similar profile to Asda (middle income groups), and have maintained this profile throughout the period. The similar patterns for Asda and Morrisons in Yorkshire and the Humber is contrary to the literature suggesting that a growing importance on fresh and quality foods were boosting sales at Morrisons, but hitting Asda hard (Kantar Worldpanel, 2010). Figure 6.13(c) highlights a clear distinction between the types of households that shop at Sainsbury's, as the retailer is most popular amongst the highest earning households ('£50,000+'). Nevertheless, since 2008/09 all income groups have moved away from shopping with Sainsbury's, preferring instead many of the other competitors in the market. Some industry professionals believe this is a direct result of the success of the discounters (CACI, 2011). More specifically, whilst the income profile of households shopping at Aldi and Lidl is visibly weighted towards lower earners - Figure 6.3(d) exemplifies that over time (especially since 2007 to 2009), the distance between the various household types are declining. This would suggest that wealthier consumers are shifting from the likes of Sainsbury's and trading down to the discounters. However, this is not the case for all of the '£50,000+' a year households as Waitrose have also continued to increase their share of this consumer group. This is demonstrated by the substantive increase in these households which was occurring well before the recession - suggesting Waitrose have a good customer base to continue expansion in Yorkshire and the Humber during the economic recovery.

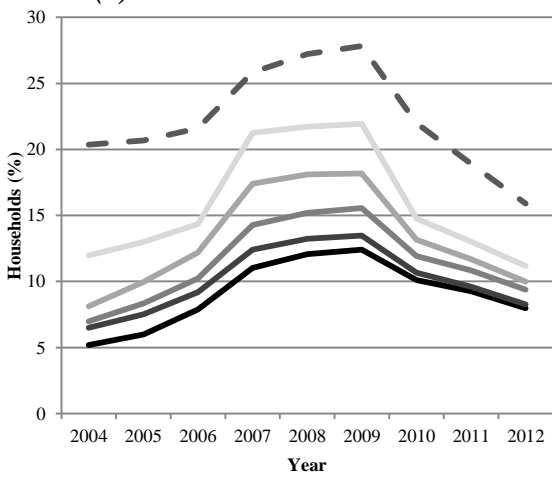
Next, Figure 6.14 exemplifies the income profiles for the selected retailers across London. First of all, Tesco demonstrate a far more varied consumer profile to that in Figure 6.13(a). For example, it is most popular with the middle income groups and has remained this way during the course of the recession. In addition, it is evident that Asda provide a more low-cost option to grocery shoppers in the capital. This is somewhat different to Asda stores in Yorkshire and the Humber that enjoy a far more varied customer base. Asda's income profile is heavily weighted towards the lowest earning households, as it has struggled to increase its share in the highest earners over the entirety of the period (comparatively flat). Further evidence of this reluctance of the most wealthy households in London to alter their behaviour is shown in Figure 6.4(c), as Sainsbury's highest earning customers have remained more loyal over the course of the economic downturn (between 35 to 40 per cent share), whilst many of the other households have left. This behaviour supports the notion that wealthy consumers are often unaffected by economic hardship (Bondy and Talwar, 2011). Although, Morrisons, have been able to increase its share across household income groups, including the wealthiest. Nevertheless, this could be because Morrisons are still relatively new to the region and are benefiting from consumers trying out the brand – in the same way Waitrose have benefited from introducing new stores in Yorkshire and the Humber. Once more, the discounters have a distinct customer profile of which the lowest earning households are their primary target audience. However, similarly to those stores in Yorkshire and the Humber, the discounters are increasing their share of wealthier households in London. This is further evidence that the economic downturn has given impetus to consumers to switch to the discounters, giving Aldi and Lidl the opportunity to challenge the big four and even the more premium retailers such as Sainsbury's and Tesco, especially in London where they are targeting new stores (CACI, 2011; Thompson *et al.*, 2012). Finally, as expected, Waitrose is overwhelmingly more popular amongst those households with the highest annual incomes in London. This customer base has also remained stable over the course of the time period, although there has been a reduction in the lowest earning consumers since 2007/08 as they 'switched' to Asda, Morrisons and the discounters in the lead up to the recession.



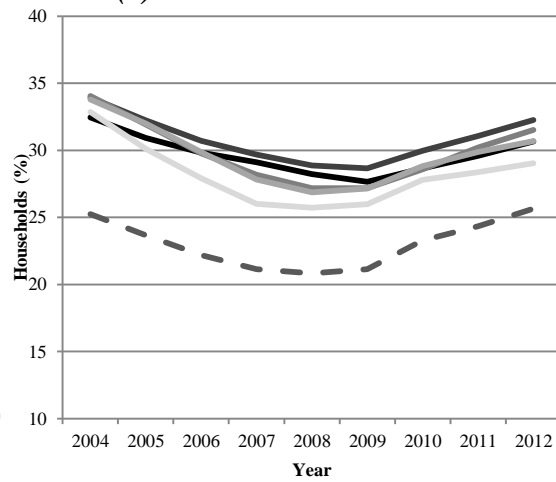
(a) Tesco



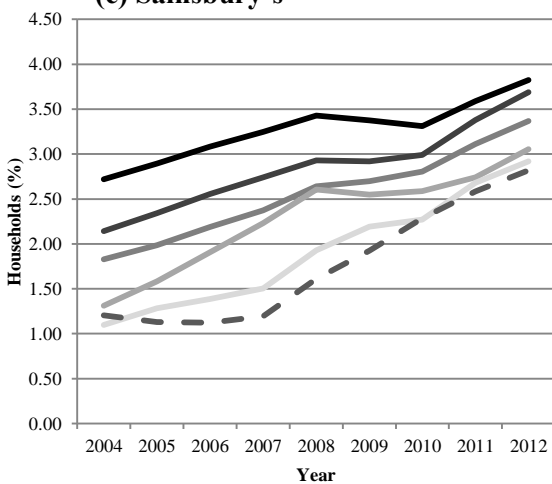
(b) Asda



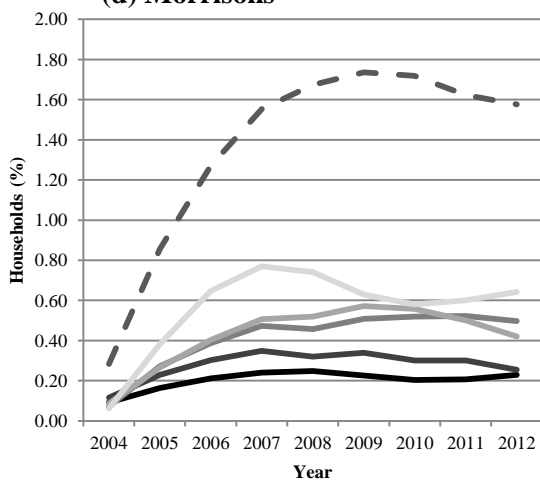
(c) Sainsbury's



(d) Morrisons



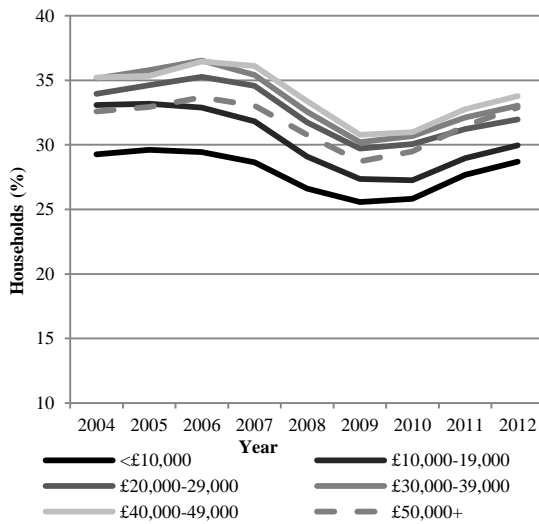
(e) Aldi and Lidl



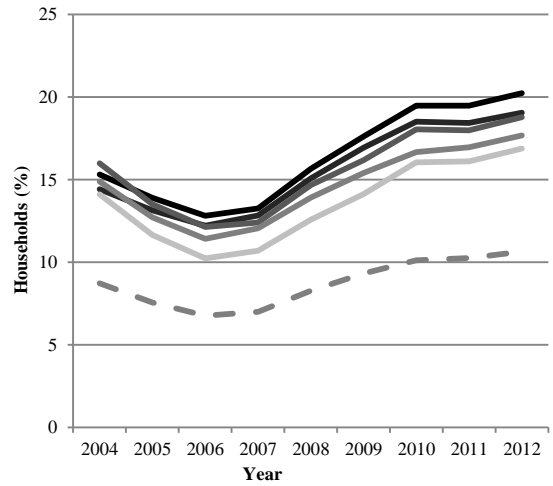
(f) Waitrose

Figure 6.13. Customer patronage by household income, Yorkshire and the Humber, 2004-2012

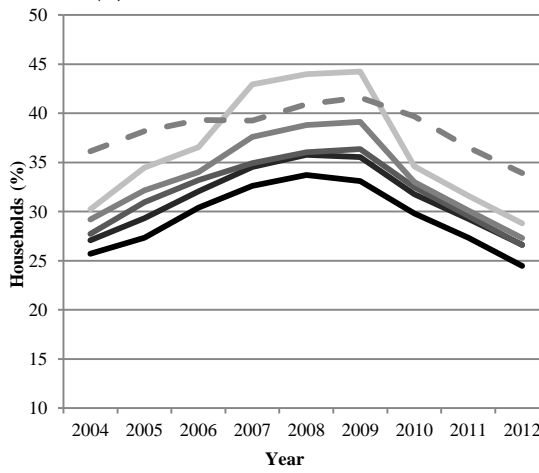
Sources: Axiom Ltd (2004-2012)



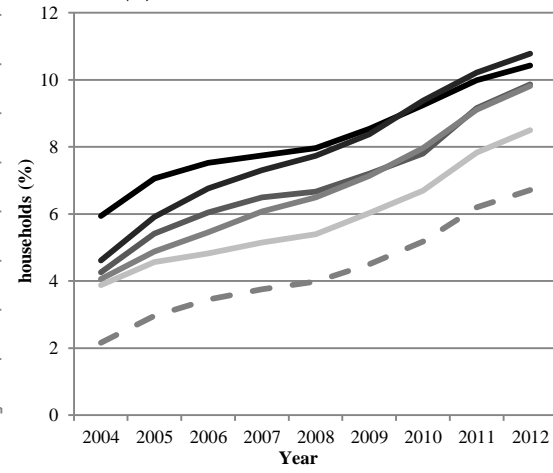
(a) Tesco



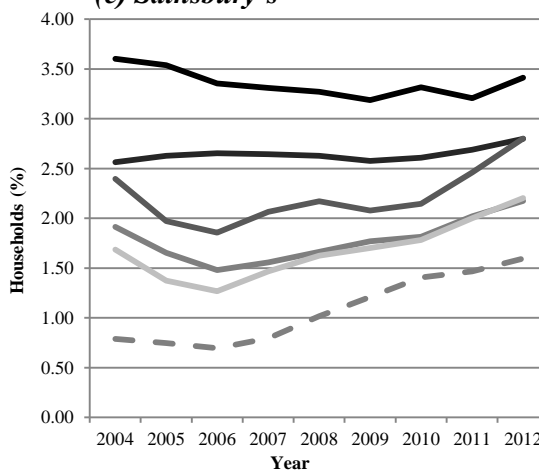
(b) Asda



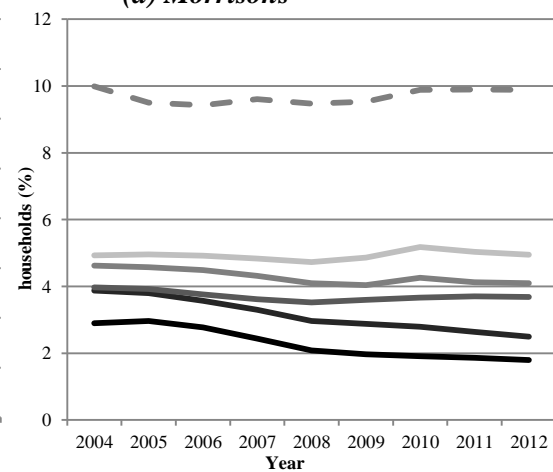
(c) Sainsbury's



(d) Morrisons



(e) Aldi and Lidl



(f) Waitrose

Figure 6.14. Customer patronage by household income, London, 2004-2012
 Sources: Acxiom Ltd (2004-2012)

6.4.4 Output Area Classifications

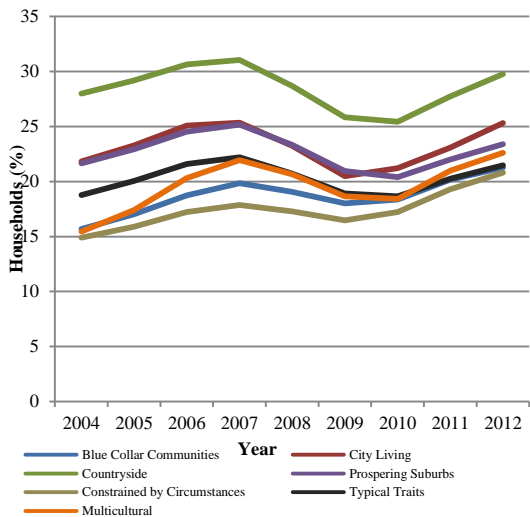
Similarly to the analysis on household grocery expenditure, this section will bring together some of the themes already discussed through the use of the ONS geodemographic OAC. Through the inclusion of geographic variables, the OAC also provides a more detailed classification than the commonly used Jictnar classification, which only classifies households based on social status (from 'A' affluent professional workers and 'E' unskilled manual workers). Once more, the same six retailers previously discussed will be examined, for a more extensive analysis of retailer consumer profiles see Thompson *et al.* (2012).

In Yorkshire and the Humber, Figure 6.15(a) demonstrates that Tesco have a high percentage of households termed 'countryside'. This is a result of the increased investment Tesco have made in large out-of-town supermarkets since the 1990s (see Chapter 3 and 5). However, Tesco also have a large share in the 'city living' supergroup, more wealthy consumers that live in city centres. This highlights the diversity of Tesco's store network as their smaller formats allow them to reach all types of consumer. Interestingly, since 2008/09 there has been a rise in the percentage of households from this supergroup shopping at Tesco – arguably a result of many consumers turning to top-up shopping in smaller convenience stores to reduce waste and save money. It might have been expected that Asda would have a distinct geographical profile given a similar sustained investment in large out-of-town hypermarkets. However, given the dramatic rise in car ownership over the last 20 years (see Chapter 3) most consumers have access to these stores. Therefore, it is likely, that Tesco's large share in the 'countryside' supergroup is more of an indication of wealth than geography (see Section 6.4.4). It is worth noting however that Asda have seen a visible rise in the percentage of 'Multicultural' households. Whilst this could be accredited to the recession, it should be noted that Asda have been one of the main drivers in targeting south Asian consumers. For example, whilst extending its food ranges, in 2009, Asda (George) also launched a range of salwar kameez, duppattas, kurtas and churidars for its Asian customers (BBC, 2009). As one might expect from the analysis in Section 6.4.3, Figure 6.15(c) highlights the more affluent profile of Sainsbury's consumers ('city living' and 'prospering suburbs' supergroups). Similarly to Tesco, the large percentage of 'city living' households is likely a result of the smaller Sainsbury's Local stores located in densely populated areas. Unlike many of the retailers in the region, the customer profile of Sainsbury's has remained relatively stable over time. In comparison, since 2004/05 Morrisons have been losing many of their 'multicultural' households which were once their most populous customer base. As such, Morrisons have become far more associated with the more deprived OAC supergroups – specifically those termed 'constrained by circumstances'. Interestingly, the recent move by

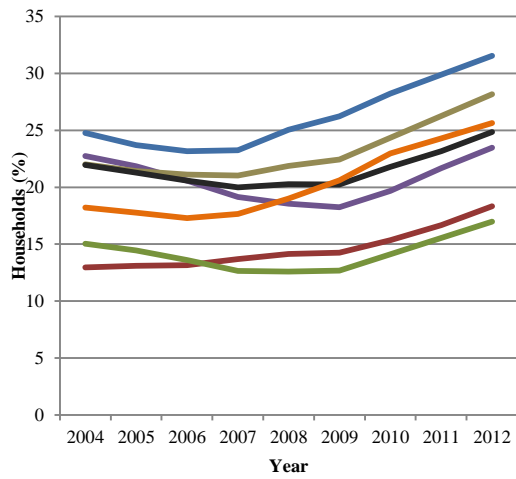
Morrisons into the convenience sector is arguably a strategy to increase its share in the 'city living' supergroup, of which is their weakest customer base.

Figure 6.15(e) illustrates that since 2004, the discounters have made inroads with many other household types. For instance, there has been a gradual increase in 'countryside' and 'city living' consumers as Aldi move out from their traditional inner-city locations. These OAC supergroups generally represent more affluent households and thus exemplify how wealthier consumers were 'switching' to Aldi and Lidl even before the recession struck (Thompson *et al.*, 2010a; CACI, 2011; Thompson *et al.*, 2012). However, there is no doubt that the recession has strengthened the discounters position as it did in the 1990s, as both 'multicultural' and 'prospering suburb' households have noticeably started shopping at Aldi and Lidl more often. Given the distinct differences in these customer groups, there is undoubted truth to the comments made by Gritten (2011) who believes that the recession is forcing people to evaluate their personal and household finances whether they are rich or poor, young or old. However, Figure 6.15(d) also provides a stark reminder that many of the current trends have been occurring for many years. More specifically, the success of Waitrose in Yorkshire and Humber is a clearly a result of its popularity amongst the wealthy 'city living' group, which has been growing at a rapid rate since 2004.

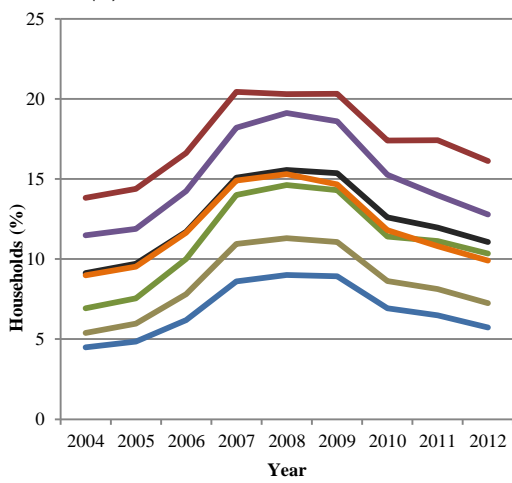
In conjunction, on examining Figure 6.16 it is clear that there are distinct regional profiles in the customers for certain retailers. For example, in London, Tesco are favoured most by 'typical traits' and 'blue collar communities' - compared to Yorkshire and the Humber where they have a wealthier consumer base. The discounters profile also highlights how 'multicultural' consumers have long been their traditional customer base and the rise in households from 'prospering suburbs' has not been as dramatic. This could be a reflection of the uneven geographies of the recession as unemployment has been far greater in Yorkshire and the Humber. Nevertheless, it cannot be denied that since 2008/09 Aldi and Lidl have also increased its market share in the capital. There is also evidence of retailers that have a consistent profile regardless of the region. In London, both Asda and Morrisons clearly provide a low-cost option for households termed 'constrained by circumstances' and 'blue collar communities'. However, there has been a noticeable rise in customers from 'prospering suburbs' since 2008, possibly trading down from Waitrose since the recession. Asda also recognise it has a relatively strong presence with 'multicultural' households in London – having opened its first 'ethnic store' in Hounslow in 2009 (only stocks Asian food products).



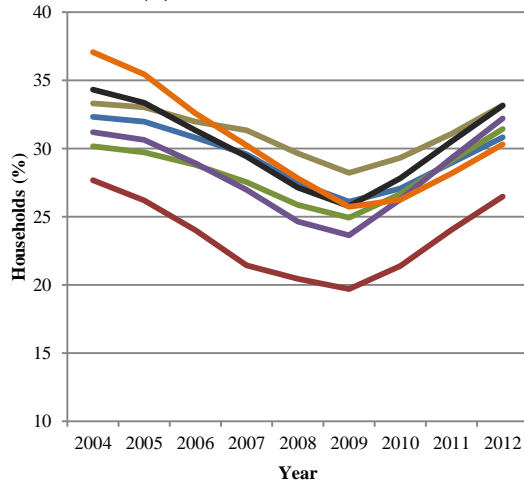
(a) Tesco



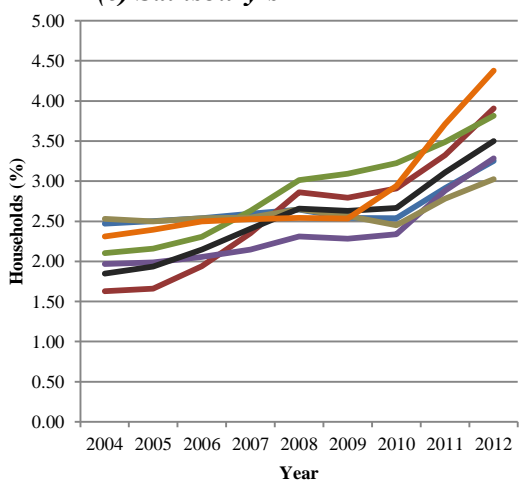
(b) Asda



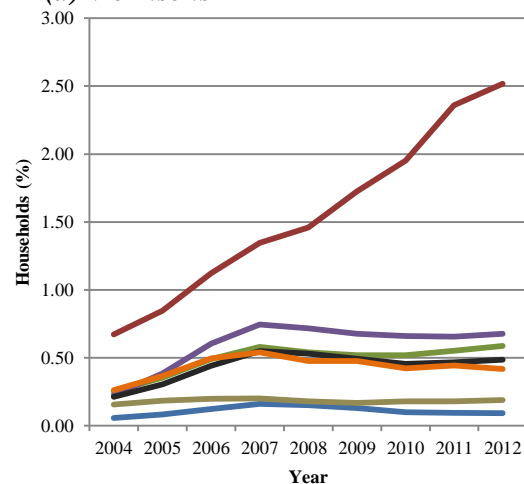
(c) Sainsbury's



(d) Morrisons

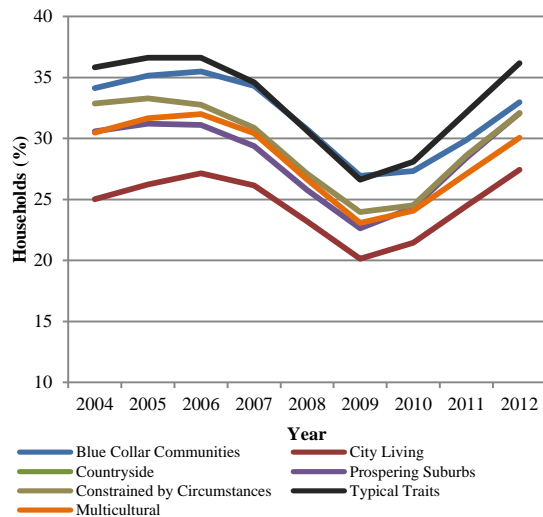


(e) Aldi and Lidl

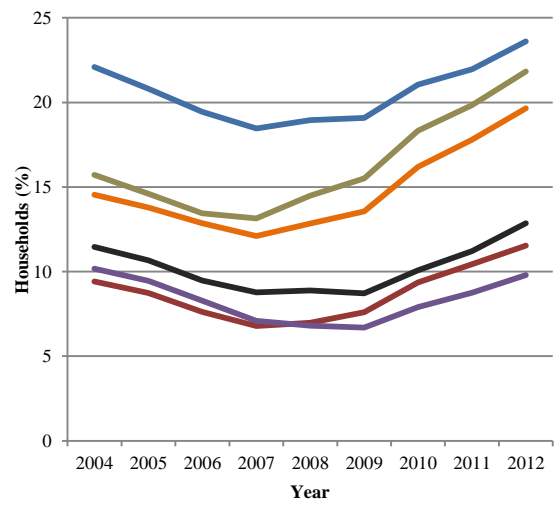


(f) Waitrose

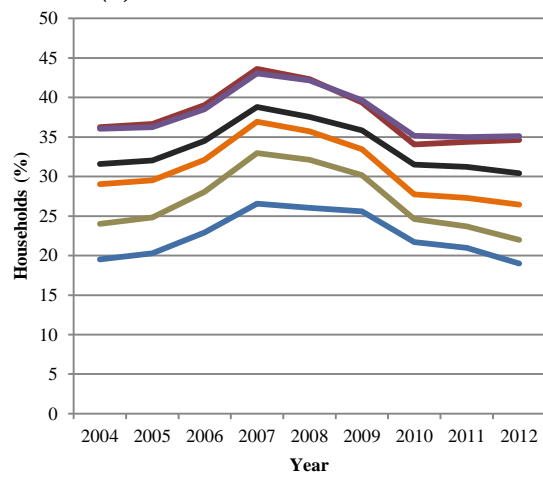
Figure 6.15. Customer patronage by 2001 OAC, Yorkshire and the Humber, 2004-2012
 Sources: Axiom Ltd (2004-2012); Vickers and Rees (2007)



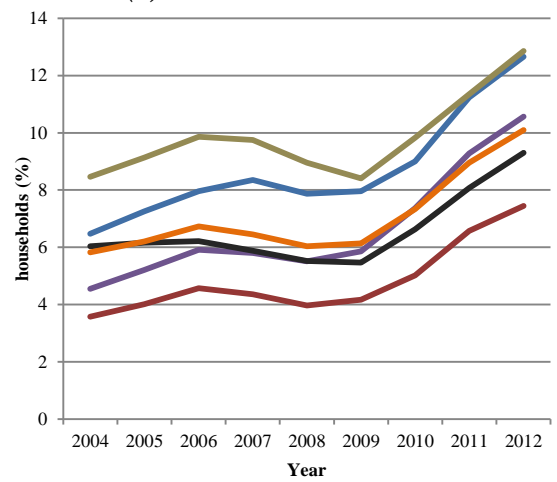
(a) Tesco



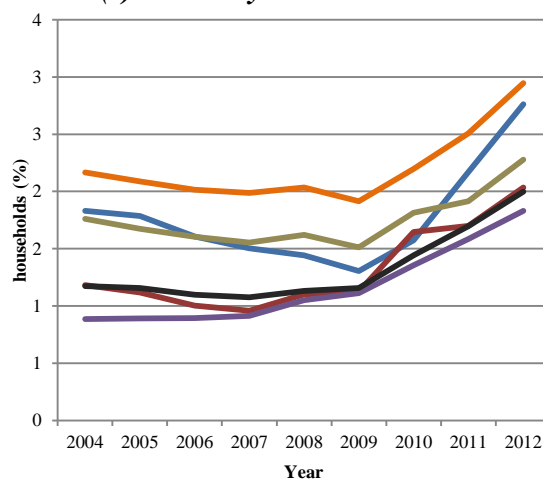
(b) Asda



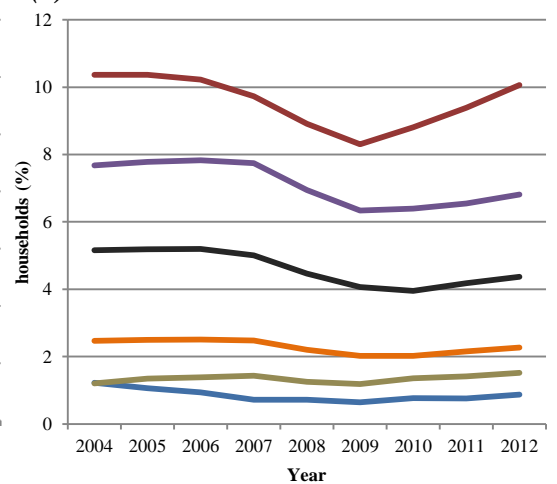
(c) Sainsbury's



(d) Morrisons



(e) Aldi and Lidl



(f) Waitrose

Figure 6.16. Customer patronage by 2001 OAC, London, 2004-2012

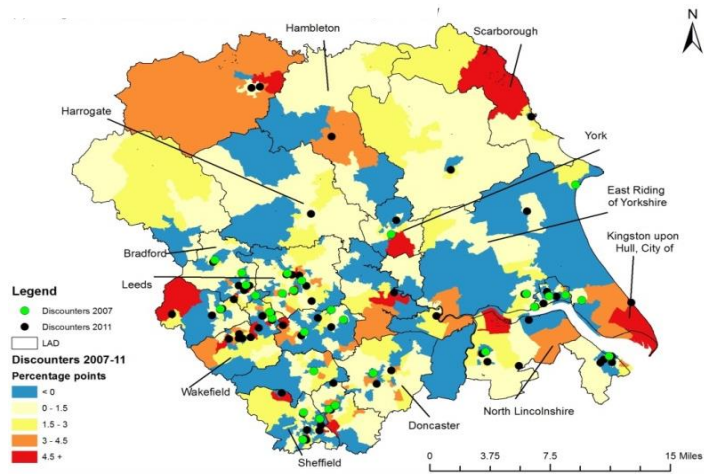
Source: Acxiom Ltd (2004-2012)

6.4.5 Geographic Variations

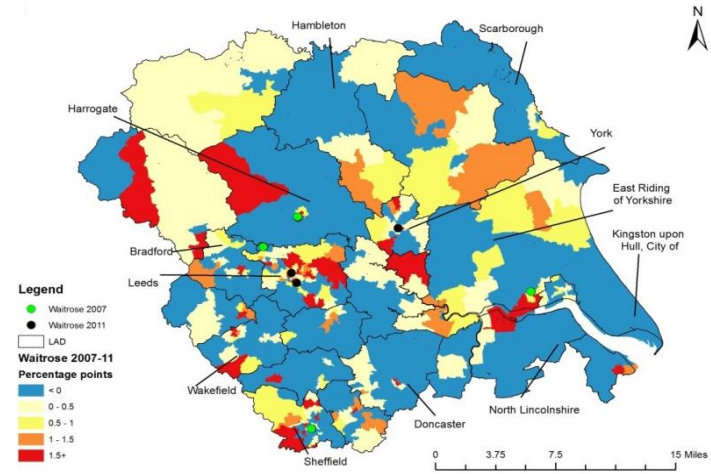
On a number of occasions in this thesis, the geographic patterns of consumer behaviour through the recession have been explored. However, it has often been difficult to determine whether or not specific trends are directly associated with the recession. Therefore, in this final section on customer patronage, low-level changes in market share are explored in relation to the introduction of new stores in a given catchment. More specially, Figure 6.17 illustrates the spatial patterns of growth (MSOA level) between 2007 and 2011 for the discounters (Aldi and Lidl) and Waitrose. The remaining discounters and Waitrose form the discussion ahead of the other retailers, for they have demonstrated the most interesting trends in other aspects of the research. The maps highlight the store networks for each retailer in 2007 (green), overlaid on top of the store networks for 2011 (black). The combination of these two pieces of information helps establish whether growth since 2007 (start of economic downturn) was triggered by the introduction of a new store, or customers 'switching' from competitors.

In Yorkshire and the Humber, it is evident that growth for the discounters has been the result of both new stores being introduced to the system and customers simply moving from other brands. This supports the point that both demand and supply must be considered collectively when making conclusions about the effects of the recession. For instance, the growth in North Yorkshire (Hambleton and central Harrogate) is clearly a result of the new stores which were not in the store network in 2007. In London, there is arguably more of a clear divide between growth in north London (new stores) and south of the river (existing networks) – suggesting the discounters are possibly targeting more affluent areas (north London) for their new stores.

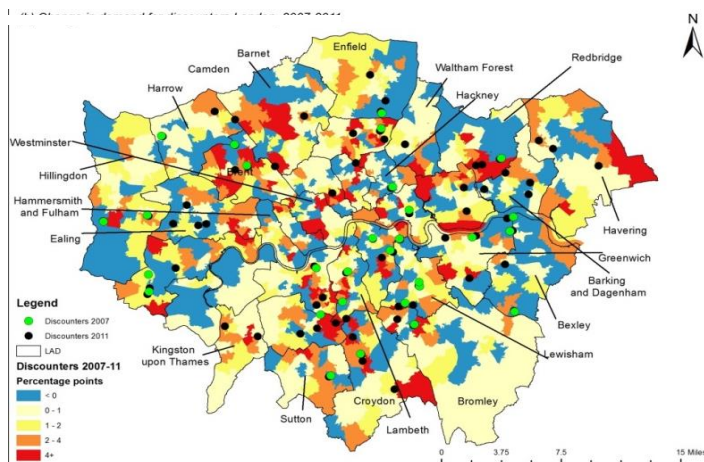
In contrast, in London where, Waitrose already has an established network (Figure 6.17(d), a great proportion of growth surrounds existing stores. This is particularly evident in the more affluent areas of north London, consistent with the growth of the households from the 'prospering suburbs' supergroup in Figure 6.16(f). The areas illustrating the highest increase of households can be found towards central London. These sites contain both a large supply of current and new stores which are combining to generate demand. This explains the high proportion of 'city living' households shopping at the Waitrose in Figure 6.16 (f), and the continued growth beyond 2007. In Yorkshire and Humber, it is difficult to make firm conclusions as Waitrose have not been in the region for long, meaning the level of growth is minimal. Nevertheless, Figure 6.17 does highlight the existence of larger catchments compared to the discounters – a likely consequence of the more wealthy and mobile customer base.



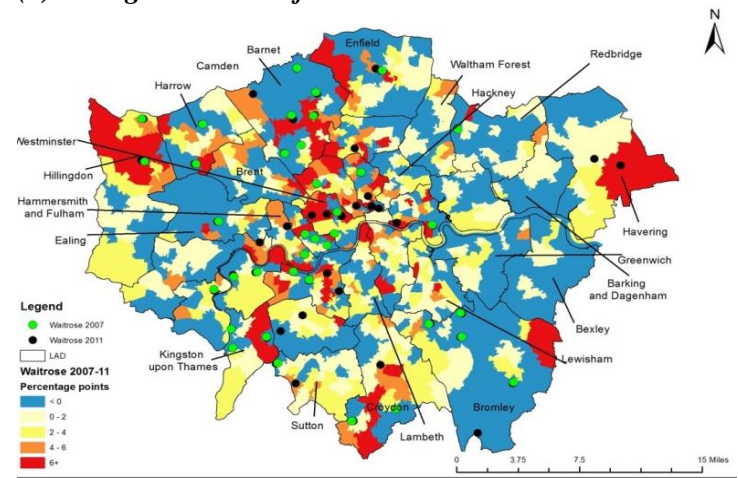
(a) Change in demand for discounters Yorkshire and the Humber



(b) Change in demand for Waitrose in Yorkshire and the Humber



(c) Change in demand for discounters Yorkshire and the Humber



(d) Change in demand for Waitrose in London

Figure 6.17.. Spatial patterns of growth for discounters and Waitrose, 2007-11

Source: Acxiom Ltd (2007, 2011); GMAP Ltd (2007, 2011)

6.5 Household Trends in E-commerce

Chapter 3 suggested a number of points that need to be explored in more detail regarding retailing and e-commerce. First, a number of studies highlighted differences in activity rates by demographic and socioeconomic groups (e.g. Weltreveden. 2007; Clarke *et al.* forthcoming). It is argued that e-commerce users are more likely to be young, affluent and from professional backgrounds. Second, studies suggest that there are interesting rural/urban differences in usage and that in short, geography seems to matter for e-shopping (Farag *et al.*, 2006). This hypothesis has already been touched upon to some extent in Chapter 5. However, there is still a need for further analysis at a more detailed spatial scale. Third and related to the second argument above, access to physical stores may also be important in understanding spatial patterns. Thus, do we see greater usage of e-commerce in areas where access to physical stores is limited – so called ‘food deserts’?

6.5.1 Demographic Analysis

The following section will concentrate on exploring how different individuals and households have adapted their behaviour with regard to online grocery shopping. Particular attention will be given to the demographic factors such as age, gender marital status and household size – all identified in Chapters 2 and 3 as primary factors that influence online behaviour.

Age and Gender

In Chapter 3, age and gender were clearly identified as discriminators in terms of e-commerce. Consequently, Figure 6.18 displays the frequent use of e-commerce to purchase groceries by age group and gender for Yorkshire and the Humber and London. It would have been preferable to analyse data prior to 2007, but the question about online grocery shopping was not included on the ROP before then. Nevertheless, it is still possible to identify those trends and patterns which have occurred since the recession started. Figure 6.18 shows that overall; the younger a person is the more likely they are to use the internet to purchase groceries. Interestingly, it would appear that in both Yorkshire and the Humber and London, the very elderly (aged 80+) show higher than expected rates of ecommerce in the grocery market. The literature states that, in general, the elderly prefer not to use the internet, favouring instead to shop in stores as is evident for those aged between 50 and 79 years old in Figure 6.18. Therefore, given the higher rates in the 80+ categories, it could be argued that this is actually an issue of mobility. More specifically, as consumers reach a point where food trips are not feasible, they may in fact be turning to the internet as an alternative route to market. If this is in fact the case, with the continuing ageing of the population across Britain, this consumer group will become vitally important in the food retail sector. Additionally, in the context of the two different regions,

those individuals living in London are also more likely to use the internet to do their grocery shopping than consumers of a similar age and gender in Yorkshire and the Humber. This links back to the argument that technology tends to diffuse out from centres of innovation (innovation-diffusion hypothesis). Rolling forward another few years, it is predicted that the rates in Yorkshire and Humber would reflect those seen in London today.

In addition to age, variations in e-purchasing patterns are also structured by gender. The literature would suggest that males are consistently more likely to patronise the internet than females (Weltreveden, 2007). In general, Figure 6.18 supports this, as the highest rates of penetration are found in males both in Yorkshire and the Humber and London. However, in the London data, this is seen to a far greater extent. These greater levels of usage within the male population could be a result of the increased value attached by men to (reduction in) time spent shopping, or perhaps a lower emphasis on quality (see Wilson-Jeanselme and Reynolds, 2005).

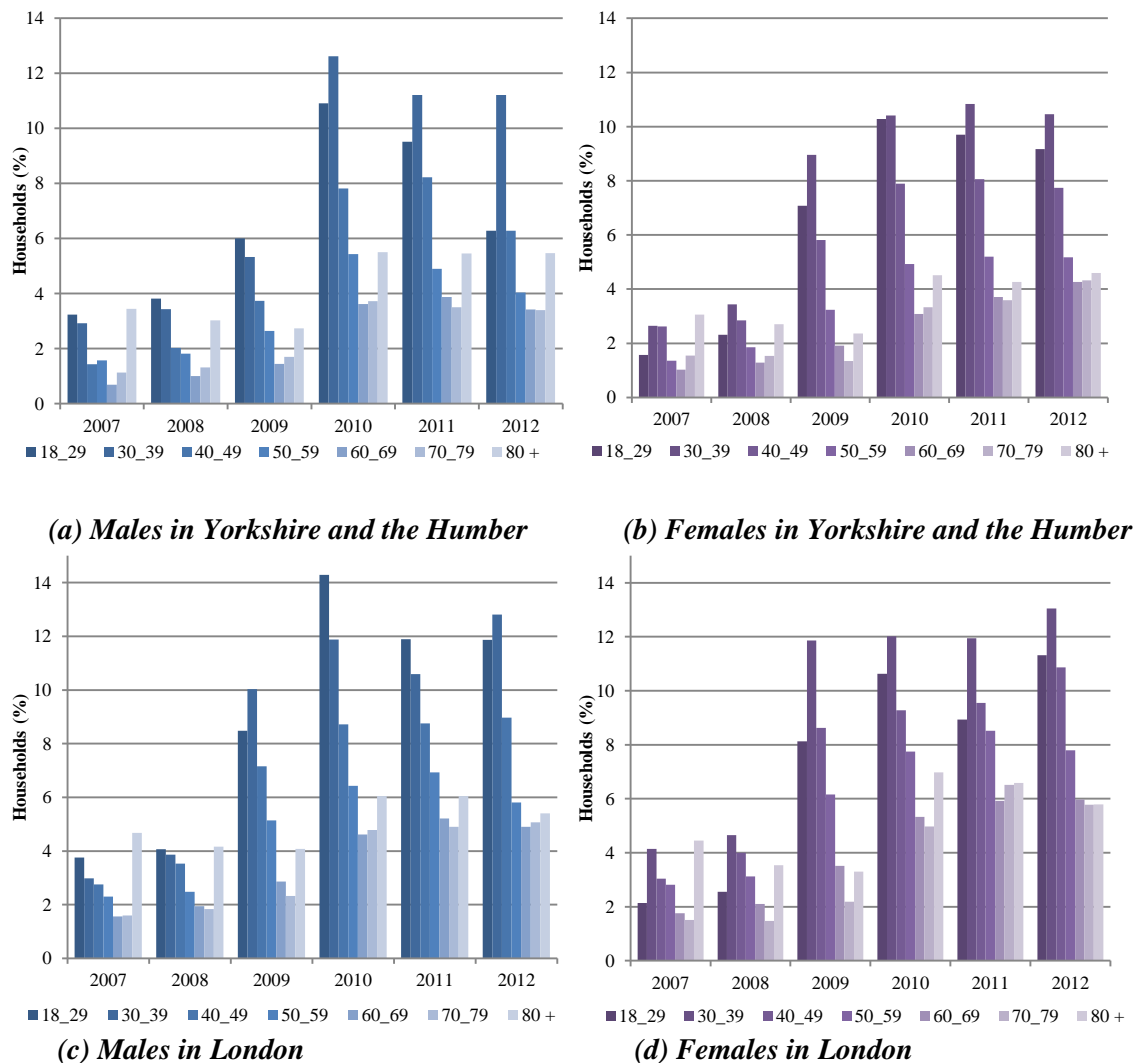


Figure 6.18. Gender and age of HRP that use the internet ‘often’ to buy groceries, 2007-2012

Sources: Acxiom Ltd (2008-2011)

In terms of the level of change through the recession and across the period in general, Figure 6.18 shows mixed results. For instance, in both regions, the general trend between 2007 and 2012 has been an increase in e-commerce take-up, with a slight decline over the last two years (as the economy falls back into recession). A more detailed look at the different age groups reveals that the highest levels of growth has been in the younger age groups (18-29 and 30-39 years). However, looking at the recent decline in the usage of e-commerce in Yorkshire and the Humber, the younger age groups show the greatest decline. In comparison, growth in many of the other age categories has remained relatively consistent. It could therefore be argued that these younger consumers are far more informed and reactive to market change, quick to take up new technology and quick to change their behaviour in harsher economic times. In comparison, the opposite can be seen in London. All consumers under the age of 50 have actually continued to increase their use of the internet for grocery shopping, although the rate of growth has slowed. This regional difference could be an issue of supply, other demand characteristics or because the use of the internet as a route to market is far more acceptable in London (been using it longer). It also worth pointing out that in both regions, in 2007 and 2008, young males (18- 29 years) showed the highest levels of usage. Then, in 2009 in London, and 2010 in Yorkshire and the Humber, this age group is overtaken by males aged 30-39. This could be related to household income. For example, individuals aged 30-39 are more likely to have a greater annual income than those in the early stages of their career and are thus able to afford the delivery costs associated with online deliveries. Furthermore, during the recession when youth unemployment has been its highest in Yorkshire and Humber (Chapter 2), it is likely that that many younger people have shifted to cheaper channels.

Household Size

It has already been established that household size is a major determinant of consumer behaviour in the grocery market, however little is known about the impact this has for online food shopping. In order to provide more information on this topic, Figure 6.19 disaggregates online grocery shopping usage by household size for Yorkshire and the Humber and London.

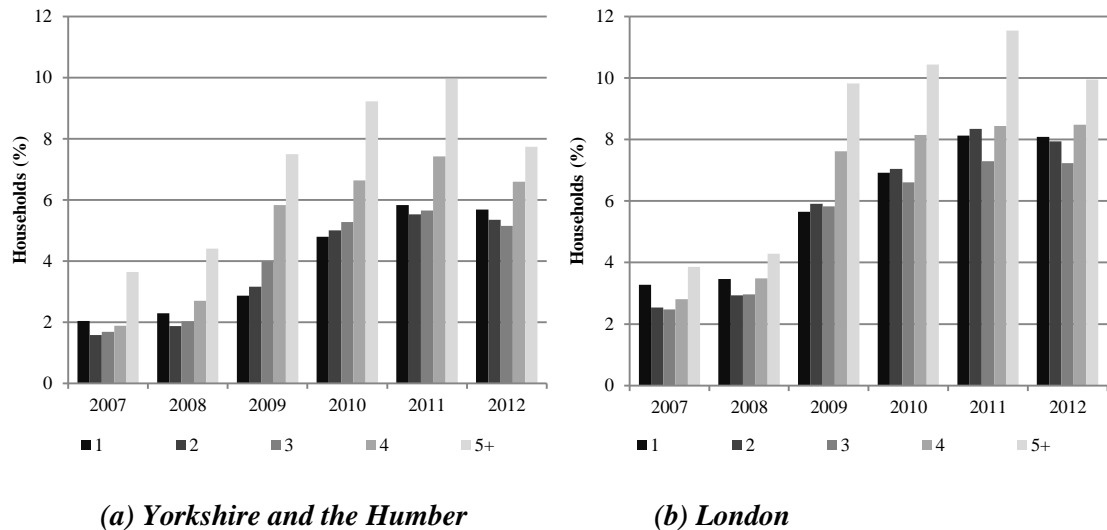


Figure 6.19. Percentage of households that use the internet ‘often’ to buy groceries by household size, 2007-2012

Sources: Acxiom Ltd (2007-2012)

It would appear from the most recent data in Yorkshire and the Humber that larger households are most likely to use the internet for grocery shopping. Therefore, it could be argued that larger households/families that have limited time to shop (Mägi, 2003), are turning to the internet to make grocery shopping easier. However, this is not a simple linear relationship. For example, 1 and 2 person households show higher rates than 3 person households. This is likely explained by the fact younger people (whom show increased levels of penetration) are likely to inhabit single person households. Between 2007 and 2008 in Yorkshire and the Humber, 1 person households actually recorded the second highest rates in the region. Nevertheless, during the period of economic downturn in 2009 and 2010, growth in these households was far slower than larger households. When the economy began to recover in 2011, we see a similar pattern to that in 2007 (pre-recession) as 1 person households overtake 2 and 3 person households. Furthermore, between 2011 and 2012, the rates have stayed relatively consistent in comparison to the other groups which have all clearly reduced their online usage. A similar trend is seen in London (Figure 6.19(b)). However, only households with five or more people decreased their online frequency for grocery shopping between the last two years.

6.5.2 Socioeconomic Analysis

In addition to demographic factors, it is known that a number of socioeconomic variables influence online shopping. Consequently, this section will concentrate on analysing the impact that annual income, mobility and accessibility to physical stores have on the frequency to use the internet to purchase groceries.

Income

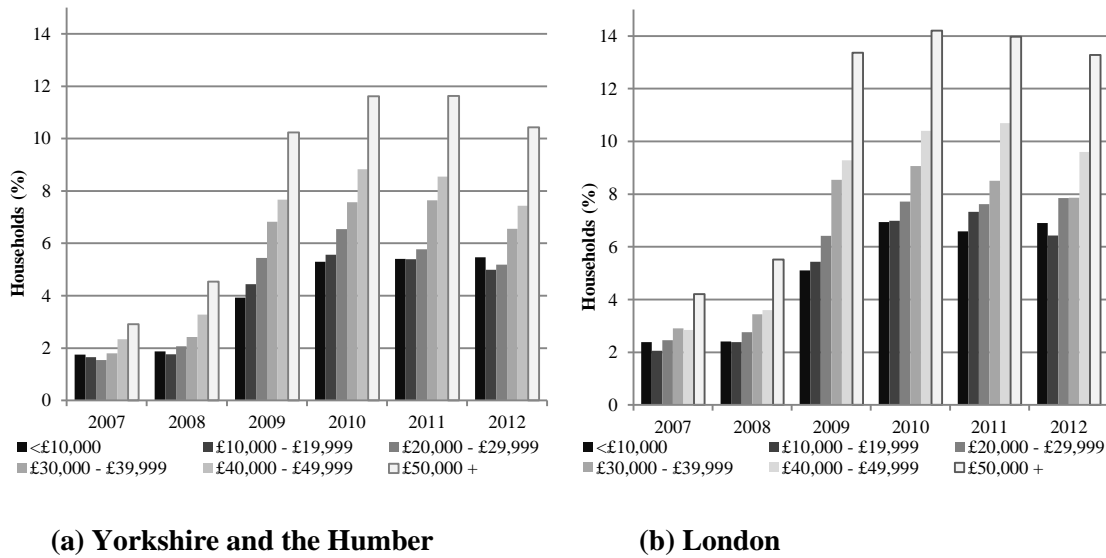


Figure 6.20. Gross annual income for households that use the internet ‘often’ to buy groceries, 2007-2012

Source: Axiom Ltd (2007-2011)

Starting in 2007 and 2008, when the ‘Credit Crunch’ and subsequent recession began to take hold of the country, online grocery rates were higher in more wealthy households in both Yorkshire and the Humber and London. Interestingly, those earning less than £10,000 a year were not the lowest (either region). However, further exploration of this category reveals that rates for those that never use the internet to purchase groceries are actually highest in this group. This is because of a combination of factors. For instance, in addition to high computing costs, the delivery charge for most e-commerce operation systems makes this mode of distribution even more prohibitive to low income consumers. As the economy moved out of recession in 2009 and through to 2011, the relationship between online grocery shopping and income becomes far more defined – the higher the income, the more likely you are to use the internet to purchase groceries (more evident in Yorkshire and the Humber). Moving forward into 2012 when the economy went back into recession, all income categories record a decline in the percentage of households apart from those with the lowest income. Consequently, we see a pattern similar to that when the original recession began in 2007/08. This is witnessed in both regions, and suggests that the internet may offer a number of counter-recessionary characteristics for more deprived consumers in searching for low-cost alternatives (Kimberley, 2008; McEleny, 2009). There could also be some interaction with the age variable here, in that the very elderly which have already been found to have higher than expected rates during this period are often low earners.

Mobility and Accessibility

Mobility and e-commerce have generated much discussion in the literature surrounding grocery market retailing, as the rise in the number of consumers owning a car has led to the development of large out-of-town supermarkets. Consequently, Figure 6.21 disaggregates the percentage of households between 2007 and 2012 that shop online frequently for groceries by the number of cars attributed to that household.

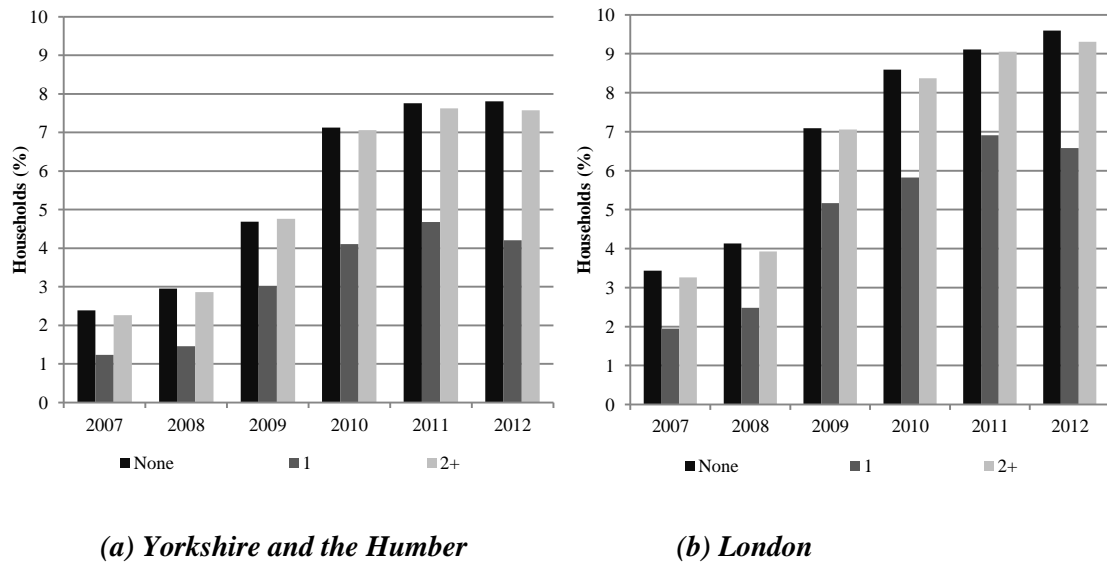


Figure 6.21. The number of cars in households that use the internet ‘often’ to buy groceries, 2007-2012

Sources: ROP (2007-201)

Figure 6.21 shows that there is a conflicting pattern with regard to the number of cars in a household and the likelihood that household shop online for groceries. Consistent with the literature, those households which have limited mobility (no car) show the highest rates in both Yorkshire and the Humber and London. The argument here is that, in order to do a weekly food shop, most customers need a car, especially in areas where food provision is low (the efficiency-hypothesis by Farag *et al.* 2006). Moreover, this trend has remained throughout the period, which raises the point that despite the recession, for those consumers without a car and thus poor access to grocery stores, the internet remains one of the only viable options to purchase food. Surprisingly, the lowest rates are for those households with access to one car, whilst those with two or more cars demonstrate very similar levels to those with no car at all. It is expected that this because of the income factor which has just been discussed. For instance, households with two or more cars are likely to have high annual incomes and therefore are more likely to use the internet to purchase groceries. Alternatively, there could also be a geographical factor at work here, for households that live further from a grocery store may have a greater need for more cars. This is something that will be explored in detail in Section 6.5.4.

Table 6.5 displays the average distance that consumers travel to their nearest grocery store (over 3,000 sq ft). The figures are also broken down by the three main online food retailers and by ‘online’ (frequently use the internet for grocery shopping) and ‘offline’ customers (never use the internet for grocery shopping). The results in Table 6.5 show strong support once more for the efficiency hypothesis. It is clear that for all the major grocers, online customers have much poorer physical access to retail outlets than their offline counterparts. In all cases, online consumers have further on average to travel to their nearest grocery store than those which never use the internet. This is most evident for those customers that shop at Asda, identified in Chapter 6 as having a large number of hypermarkets, which are traditionally located in out-of-town retail parks.

Table 6.5. Average distance travelled to nearest grocery store by retailer for online and offline customers in Yorkshire and the Humber, 2012

Retailer	Offline (miles)	Online (miles)
Asda	2.54	4.90
Tesco	2.12	3.47
Sainsbury’s	2.44	3.14

Sources: Axiom Ltd (2012); GMAP Ltd (2012)

6.5.3 Geographic Variations

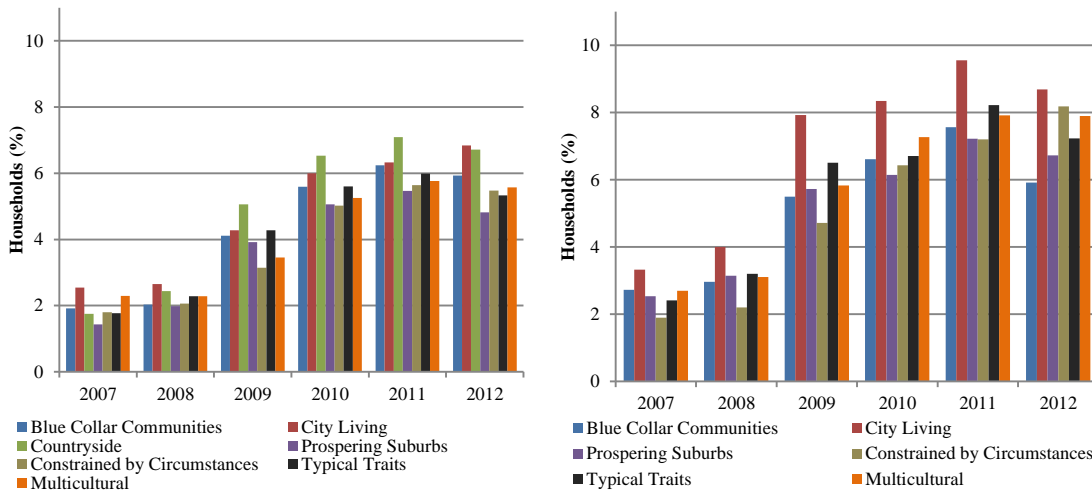
The final section will focus upon the direct influence that geography has on the frequency of online grocery shopping, expanding on the more top-level analysis in Chapter 5. As with other sections in this chapter, this will be achieved through an examination of the 2001 OAC and by mapping online market share rates at far more detailed spatial scales.

Output Area Classification

As discussed, there are clearly many potential interactions between the individual demographic, socioeconomic and geographic variables associated with online grocery shopping. Therefore, it is worth considering whether a more multivariate analysis can provide useful insights. Figure 6.22 provides a composite assessment using the OAC for both Yorkshire and the Humber and London. In Yorkshire and the Humber, the most recent data illustrates that the ‘city living’ (6.84 per cent) and ‘countryside’ (6.71 per cent) supergroups have the highest rates of take-up. This is interesting, as their pen portraits would suggest they are the polar opposites in terms of location (Vickers and Rees, 2007). However, they do contain a similar mix of people in terms of wealth (both considered wealthy areas). Despite both supergroups demonstrating above average wealth, the patterns suggest that income alone is not enough to drive e-commerce sales in the grocery

market. Based on the evidence so far, it is likely that age and income are driving the high rates for the 'city living' group, and location and income are driving the high rates in the 'countryside'. Further breakdown of the data reveals the highest levels of penetration in 2012 are actually in 'transient communities' (city living supergroup), 'prospering younger families' (prospering suburbs supergroup), 'agricultural (countryside supergroup) and 'village life' (countryside supergroup). The difference in the make-up of these areas illustrates how complicated trends in e-commerce actually are. For instance, it counteracts the argument that consumers in more rural areas are more concerned about food being fresh (Cullen and Kingston, 2009). Online food shopping is primarily regarded as a method which makes things more convenient, at the cost of freshness. Furthermore, it reinforces the point that online grocery retailing can actually be more relevant to rural consumers (Lennon *et al.*, 2007), because of their limited access to a grocery store (efficiency hypothesis of Farag *et al.* 2006).

Given the discussion of internet connection diffusion from London and the South East in Chapter 5, we might also expect internet usage to be higher in similar communities in London compared to further north – in other words we might expect to see a higher market share within areas termed 'city living' compared to 'city living' areas in Yorkshire and the Humber. The rationale for this hypothesis comes from surveys which have shown that early adopters of online channels are likely to purchase more frequently than late adopters (Shih and Venkatesh, 2004; Chiagouris and Ray, 2010). Figures 6.22 (a) and 6.22(b) indicate that this rationale is apparent – for the London data shows higher rates of penetration for all OAC supergroups in comparable years. The main difference with the London data to Figure 6.22(a) is that the 'city living' group is more defined and there is a greater importance placed on the 'multicultural' group (especially since 2010). As with previous analysis, it is not possible to compare the 'countryside' group because the London region has very few OAs defined in this classification. Nevertheless, in Yorkshire and the Humber, over the period there is definite evidence of increased growth from this supergroup. The shift from urban to rural in terms of high usage, demonstrates how technology can diffuse outward from urban centres of innovation (innovation-diffusion hypothesis). In contrast to the diffusion effect, one might argue that rural users actually have the most to gain from electronic transactions, because they lack access to high quality urban retail services. Another consideration is that place of residence could be becoming less important as a determinant of internet access – as many users are actually accessing services from the workplace, and increasingly from mobile devices which could ultimately neutralise provision local to consumers to a considerable extent. However, given the clear variations in the geographic data, this is unlikely.



(a) *Yorkshire and the Humber*

(b) *London*

Figure 6.22. The percentage of households that use the internet ‘often’ to buy groceries by OAC, 2007-2012

Sources: ROP (2007-2012); Vickers and Rees (2007)

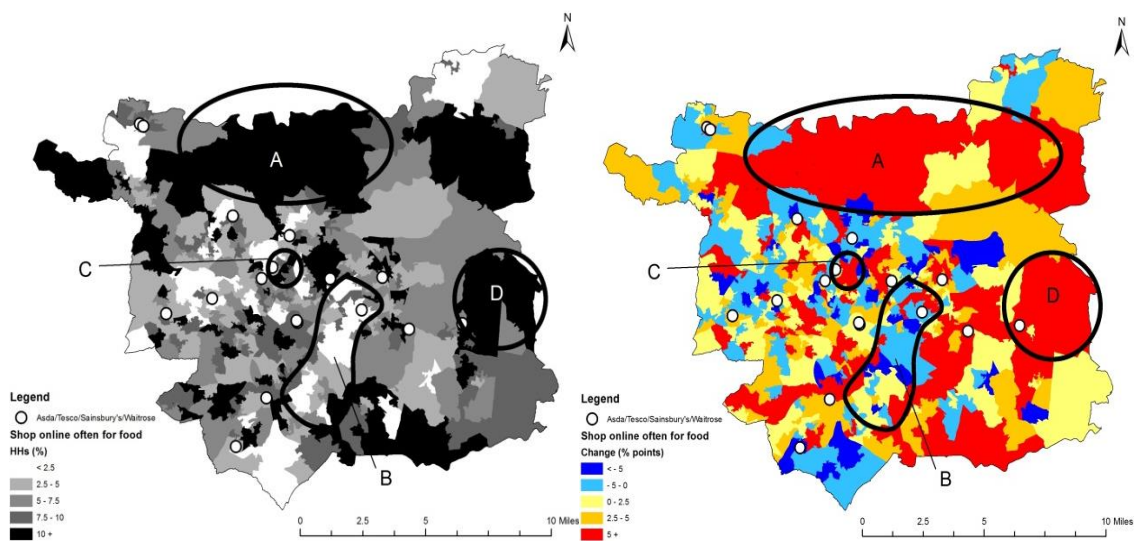
In addition to geography, the ‘multicultural’ OAC helps provide an insight into the ethnicity and online retailing, an area which has not been discussed a great deal in the literature on e-commerce. Singleton (2008) found elements of parallel with the preference of some ethnic minorities for high technology disciplines in undergraduate study. However, from the data illustrated in Figure 6.22, it would appear that ethnicity is not a substantial differentiator for online grocery shopping – possibly attributed to the limited selection of specific ethnic and cultural food types available online. In both regions the ‘multicultural’ group demonstrates modest levels of usage although it is likely that many of the other factors discussed are at work, flattening the trends.

Small Area Geography of E-commerce

In this concluding section on household trends in e-commerce, attempts are made to map some of the patterns unearthed in preceding sections. More specifically, Figure 6.23(a) exemplifies small-area (MSOA) household internet usage for Leeds in Yorkshire and the Humber for 2011. The stores for Tesco, Sainsbury’s, Asda and Waitrose (online retailers) are also shown to demonstrate access to the nearest store. These spatial patterns are thus likely to be the result of a mixture of the geodemographic (demographic, socioeconomic and geographic) variations discussed. High market share for online grocery shopping can be seen in the more rural and affluent northern suburbs of Otley and Wetherby (area A). Moreover, high rates are also observed in Headingley and Chapel Allerton (area C). This part of the city is associated with a high number of students and young professionals. Although students are not high earners, their

age profile fits the geodemographic analysis above, and of course many are highly computer literate with a high likelihood to adopt new technologies. In contrast, to the south and south east of the city centre, there is evidence of low market penetration in Burmantofts and Richmond Hill (area B). These are some of the most deprived neighbourhoods in the city. Given the limited amount of stores in this area (food desert, Wrigley *et al.*, 2002), it might be argued that households in these areas should be more likely to use e-commerce because of the poor accessibility to larger stores (see Section 6.5.3). However, in area B this is not the case, which suggests that accessibility is not the only driving force. There is a massive irony here: the very areas that could benefit the most from e-commerce in terms of improving access to high quality fruit and vegetables are the areas that can least afford to do so. In addition to direct access costs (computer hardware, broadband, etc.), the delivery charge for most e-commerce operating systems makes this mode of distribution even more prohibitive to low income consumers. Moreover, to add to that injustice, some firms have already blacklisted certain public housing estate areas on the basis of fear of crime and harassment of drivers (Clarke *et al.*, forthcoming).

In addition, Figure 6.23(b) also exemplifies the level of change in terms of market share for online grocery shopping. The rates represent the change in percentage points between 2007 and 2009 (period of economic downturn) so that the level of growth/decline in each MSOA can be examined. Immediately, it becomes evident that those areas that display the largest increase in market share also have the largest share of the online food market in Figure 6.23(a). This would suggest that growth/decline has continued on into 2011 in the same areas. Therefore, although the growth rates are higher in the city centre and more rural areas of Leeds, given the previous analysis it is likely this was not specific to the time period (i.e. the recession).



(a) Online grocery penetration 2011

(b) Percentage points change 2007 to 2009

Figure 6.23. Online grocery penetration by MSOA in Leeds

Sources: Acxiom Ltd (2012); GMAP Ltd (2012)

6.6 Conclusion

The proceeding research has made attempts to deliver an in-depth study of the patterns, disparities and determinants of consumer behaviour in the British grocery market between 2004 and 2012 – by taking advantage of a unique commercial dataset. Whilst the research has provided an insight into the intricacies of consumer behaviour through the recession, it has also provided a much needed update to our understanding of the food retail system, in the context of what is driving behaviour and the geographic patterns that are emerging.

Initially, an exploration of household expenditure found that consumers have been forced to manage their household budgets in line with the recession. Households have cut back on both non-essential and essential items of spending due to rising inflation. Further exploration of consumer characteristics identified not all consumers have reacted the in the same way. More specifically, after documenting the steps for dealing with time-series inconsistencies in categorical data, analysis of grocery expenditure data over time illustrated distinct demographic, socioeconomic and geodemographic variations. For example, elderly households demonstrated increased levels of modification, a possible consequence of the austerity measures which have impacted heavily on pensions. Due to the importance of this demographic group (ageing population) in the food market, it is perceivable to suggest that the reduction in spending by this demographic group may have helped pushed Britain into recession. The regional comparisons (Yorkshire and the Humber and London) also shed interesting light on the geographic variations of expenditure, as those in more rural areas were found to promote higher levels of expenditure – arguably a result of growth in out-of-town supermarkets.

Next, in the context of customer patronage, the research has provided a unique contribution to the literature with regard to retailer specific consumer profiles. A number of household types were shown to demonstrate sophisticated strategies for economic shopping, utilising a wide range of brands to purchase food. In particular, evidence was provided for increased brand loyalty in older consumers in Yorkshire and the Humber, whilst London was found to offer a more competitive environment. In addition, the 2008 recession has caused certain households to break from their established routines and seek quality (Waitrose), value (discounters), and values (fresh food). This has led to a polarisation in the market whereby the discount retailers and premium brands such as Waitrose have begun to take market share from the ‘big four’, leaving them stranded in middle ground – similarly to that which occurred in the 1990 – 93 recession. However, whilst it cannot be denied that these retailers have benefitted from a certain level of ‘switching’ behaviour (especially discounters), analysis revealed growth can also be accredited to new stores being introduced to the system.

Finally, in studying the role of e-commerce, it was found that online retail sales are growing, however they are still far behind those generated from stores. In terms of the characteristics of online grocery shoppers, the interactions are complex, particularly in urban areas where socioeconomics and demographics can override accessibility effects. However, consistent with much of the literature, online consumers are most likely to be men aged 25-44, affluent, and living in city centres. Moreover, whilst e-commerce did originally diffuse out from London and the main cities, it is no longer just an urban trend. There is evidence of increasingly high usage in rural areas due to improved broadband services (see Chapter 5) and decreasing proximity to nearby stores. In terms of the recession, the evidence was inconclusive, although there were suggestions that the internet may offer a counter-recessionary mechanism in searching for low-cost alternatives.

Finally, the future for the grocery market is difficult to predict, as some trends, both cyclical and recessionary, will stick, and some will fade. However, the important questions remain. How will the new dynamics influence market development in the future, what challenges does this bring to retailers and how does this translate into opportunities for growth? Consequently, a number of these questions will be taken forward into the final two analysis chapters.

Chapter 7

Application of a Disaggregated SIM for the British Food Retail Market

7.1 Introduction

Until now, much of the preceding research has treated the issues of supply and demand in the grocery market as two separate entities. For instance, Chapter 5 was primarily concerned with the modern development of various retailers' store networks, whilst Chapter 6 documented the recent household level changes occurring in grocery expenditure and customer patronage. This has been done in a deliberate manner to ensure that the research has been following a path of natural progression up to this point. Consequently, this chapter aims to integrate these findings into a modelling framework which incorporates both demand and supply in the grocery market together with the interactions between them. Although many forms of retail model exist, the work reported in this chapter will concentrate on a Spatial Interaction Model (SIM) framework which has a long history of application in the context of retail systems and consumer behaviour (Birkin *et al.*, 2002; 2010). Such models work well in a retail context because of their emphasis on the spatial distribution of shopping trips as well as associated levels of sales, expenditures and incomes. A SIM is designed to capture the flow of expenditure that is exchanged for groceries between residential zones and grocery stores whilst retaining the main variations in behaviour discussed in Chapter 6. Thereafter, in Chapter 8, the model will be used to estimate potential growth opportunities through a series of what-if scenarios in the British grocery sector.

This chapter will therefore discuss the process of building and implementing a SIM for application in the food retail market. However, the particular interaction in this context is the development of a model that disaggregates the flow of households according to the type of consumer and type of retailer. Initially, a short review of the literature surrounding the principles of SIM will be provided in Section 7.2. To ensure all necessary elements are covered, considerations will be given to the major developments in SIM theory, calibration issues, the application of SIMs in a retail context, limitations associated with SIMs and the alternative methodologies available. Section 7.3 will then concentrate on the construction of an example

SIM in the grocery market, highlighting the differences between an aggregate and a disaggregated model. In the penultimate section, attention will be given to the production of a disaggregated SIM using the 2001 Output Area Classification (OAC). The primary topics of discussion will be the model inputs, study area and the methodology for calibrating the model. Model performance will be assessed, providing comparisons against observed data both in terms of market share, customer profiles and geographic flows. Concluding remarks will be then given in Section 7.5 with a short summary of the major findings.

7.2 Spatial Interaction Modelling Principles

Prior to outlining the construction of a disaggregated SIM, it is crucial to explain the theory underpinning this modelling approach and the different refinements that have been made over time, although a complete historical review of the advances in SIMs is beyond the scope of this chapter. For a more comprehensive review, see the work by Birkin *et al.* (2010), Roy (2004; 1990), Eyre (1999), Sen and Smith (1995). Instead, this section will present the theoretical principles that underpin a SIM, the model components, its origin and development, its calibration techniques, its application in the context of retailing and why the technique is appropriate for research on the grocery market.

Spatial interaction models are, by definition, models that are used to simulate or predict the interactions between origins and destinations (Eyre, 1999). These interactions or flows can represent goods, information, money or people. The SIM operates under two key principles: one, each flow between an origin and a destination will be proportional to the relative masses of the origin and destination; and two, each flow will relate to the level of accessibility of the destination from the origin (Birkin *et al.*, 2002; Guy, 1991). Thus, the interaction flow is directly proportional to the level of demand in the origin zone and the attractiveness of the destination zone, and inversely proportional to the distance between origin and destination. The model considers each possible origin-destination pair in turn, and calculates the level of interaction occurring between each origin and destination given the information provided from the real world (Harland, 2008).

In the context of retailing, there must be three major components for the model to function; demand, supply and interaction. In Figure 7.1, the destinations are food retail stores identified as the red dot; in contrast the black rectangle represents the origin area.

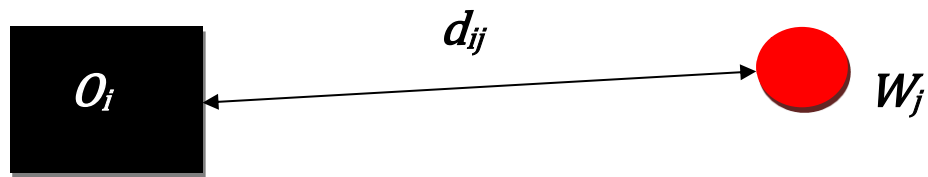


Figure 7.1. SIM components

Sources: Adapted from Harland, 2008

The, O_i term represents the amount of demand which is available in different residential zones (i). The supply component, W_j , is concerned with the ability of retail destinations (j) to attract expenditure from the residence zones (i) within the region. The last component, d_{ij} , is the factor in the model which represents the effect of the separation between origin (i) residential zones and retail destinations (j) in terms of distance, space, time or cost (Eyre, 1999).

7.2.1 Gravity Models: The Origin of Spatial Interaction Modelling Theory

As previously mentioned, spatial interaction modelling has its origins in the principles of gravity based on Newton's scientific theory of Universal Gravitation (Roy and Thill, 2004; Foot 1981). Gravity models have had an important place in retail location considerations and are considered to be the most popular of the three basic trading area models used to assess new store locations and trade area potential; the others being analogue and regression models (Anderson *et al.*, 2010). The most common and widely used gravity models in retailing include Reilly's (1931) Law of Retail Gravitation, Converse's (1949) revision and 'breaking-point model', Huff's (1964) model of 'trade area attraction' and Christaller's (1933) Central Place Theory.

The social science analogy of the gravity model originally developed in physics postulates that the interaction between two masses will vary proportionately with the product of the two masses, and inversely with the distance between them (Foot, 1981):

$$F_{12} = G \frac{M_1 M_2}{d_{12}^2} \quad (7.1)$$

where, F_{12} is the gravitational force acting between two mass bodies M_1 and M_2 , G is the empirically derived gravitational constant, d_{12} is the distance between the two masses, which in this case is squared to represent the exponential decay of interaction between M_1 and M_2 as

distance increases. The general SIM version of the gravity model has been expressed as (Wilson, 1971: 26);

$$T_{ij} = k W_i W_j f(c_{ij}) \quad (7.2)$$

where, T_{ij} is the trip interaction between origin i and destination j , W_i and W_j are the attractiveness terms that replace the mass elements, and $f(c_{ij})$ is the cost distance function between the two zones and k is a scaling constant. In the context of retailing, Reilly (1931) was the first to utilise Newton's theory of Universal Gravitation and developed the Law of Retail Gravitation to define the relative probability of two cities to attract customers (Anderson *et al.*, 2010). The aim was to describe the flow of retail trade between towns and cities on the basis that retail trade increases when the city population increases at about the same rate, and retail trade decreases inversely to the square of the distance between the two cities.

Alternatively, when discussing gravity models, one must also consider the seminal work of Christaller (1933) and the Central Place Theory. This theory surfaced only a few years after Reilly's (1931) original work with a 'central place' being defined as a centre of retailing activity such as a town or city (Anderson *et al.*, 2010). Comprehensive reviews of such work are available and their detailed reiteration here is unnecessary. However, in summary, the theory identified a hierarchy of central places relative to the assortment of goods available. It is assumed that an optimal location decision is made by the suppliers of services and that every consumer undertakes an economically rational decision (Dawson, 1980). Nevertheless, despite still being used extensively in retail location analysis, there are many criticisms of the model (Dawson, 1980.) For instance, the nearest centre hypothesis, which is the basic behavioural tenet of Central Place Theory, postulates that a consumer will visit the nearest centre supplying a good or service. However, it is now known that this only provides partial explanation for shopping behaviour and the inference results in a serious overstatement of behavioural realities in the intra-urban environment (Anderson *et al.*, 2010).

Later, Converse (1949) made an extension to Reilly's (1931) work by defining the 'breaking-point' of trade between two cities. This revision is known as the 'breaking-point model' and works under the assumption that a customer residing at the location of this trade breaking-point would be indifferent to each trade area and have a 0.5 probability of shopping at either of the two cities in question for non-specialty goods (Anderson *et al.*, 2010). Casey (1955: cited in Foot, 1981) and more prominently Huff (1964) also made important contributions to the development of gravity models. For instance, Huff (1964) proposed the model of 'trade area

attraction' which describes the process by which consumers choose one centre over several competing shopping centres. This was the first time an attempt had been made to measure the actual level of interaction between one origin and one destination by shifting the focus to the consumer rather than the supplier. Furthermore, Huff was also able to reflect travel time in the cost function rather than physical distance (Roy and Thill, 2004), and the negative power term was calibrated by empirical observation rather than simply adopting the original Newtonian distance decay exponent of -2 (Dennett, 2010). Lakshmanan and Hansen (1965: cited in Foot, 1981) also recognised the merit of Huff's model by deriving the 'retail sales potential' model from his work. Their model hypothesises that the sales potential of a shopping centre is directly related to its size, its proximity to consumers and its distance from competing facilities (Dennett, 2010).

7.2.2 Wilson's Family of Spatial Interaction Models

Despite the successful work achieved using gravity models, Senior (1979) highlights a number of deficiencies in gravity model theory. For example, the multiplicative nature of the equation means that a doubling of origin (W_i) and destination (W_j) masses, rather than leading to a doubling of the interaction, actually leads to a quadrupling of the interaction. To deal with this problem, it is possible to constrain the interaction within the system to observed information about origins, destinations or both. This technique was first made explicit by Wilson (1971), who believed that a gravity model should not be expressed as one single model but rather a set of models based on complete or partial known information about the system being modelled. These sets of models are recognised in the literature as Wilson's (1971) 'family of SIMs', with each one differentiated by the constraints that are placed on the predicted flows that are generated. Described as a considerable contribution to quantitative geography (Gould, 1972), the theoretical frameworks of these models are discussed below.

First of all, when only information about the total number of interactions is known in a given system, Wilson (1971) defines the unconstrained model as:

$$T_{ij} = kW_i^{(1)}W_j^{(2)}f(c_{ij}) \quad (7.3)$$

The F_{12} interaction term in Newton's gravity model is replaced by T_{ij} in the Wilson's model. m_1 and m_2 are replaced with the $W_i^{(1)}$ and $W_j^{(2)}$ respectively, terms which represent unknown information about the respective origin and destination masses where $^{(1)}$ and $^{(2)}$ are parameters that define the relationship between interaction and the respective mass terms. The negative

power distance decay function in the gravity model is replaced by a function of f of the cost of travel c_{ij} (which could be distance or any other cost of travel such as time or financial cost). G , in the original gravity model is also replaced by k , a constant which acts as a scaling factor to ensure that the sum of T_{ij} predicted by the model is equivalent to the known information about the total flows within the system. This can be calculated endogenously such that:

$$k = \frac{T}{\sum_i \sum_j W_i^{(1)} W_j^{(2)} f(c_{ij})} \quad (7.4)$$

where

$$T = \sum_i \sum_j T_{ij} \quad (7.5)$$

The second SIM within Wilson's family is the origin or production constrained model. In this model, the total number of flows from each origin O_i , is known and so this information is used to model outputs such that:

$$T = \sum_j T_{ij} = O_i \quad (7.6)$$

and the model takes the form:

$$T_{ij} = A_i O_i W_j^{(2)} f(c_{ij}) \quad (7.7)$$

where the balancing factor k is replaced by an origin-specific balancing factor A_i (so that the constraint is satisfied) and is expressed as followed:

$$A_i = \frac{1}{\sum_j W_j^{(2)} f(c_{ij})} \quad (7.8)$$

The third model in Wilson's family is known as the destination or attraction constrained model. This is analogous to the origin constrained model; however, in this case the total inflows to the destination, D_j , are known and thus act as the information to constrain the output of model. Consequently, the constraint can be written as:

$$T = \sum_i T_{ij} = D_j \quad (7.9)$$

and the model takes the form:

$$T_{ij} = B_j D_j W_i^{(1)} f(c_{ij}) \quad (7.10)$$

The origin mass term and the origin-specific balancing factor A_i , in the previous model are replaced with a destination mass term and the destination-specific balancing factor calculated as:

$$B_j = \frac{1}{\sum_i W_i^{(1)} f(c_{ij})} \quad (7.11)$$

Finally, the last model in Wilson's family is termed the doubly constrained or production-attraction model. In this case, both constraints formulated for the last two models are utilised so that the interactions in the model conform to both the origin O_i and destination D_j masses. Algebraically, the model can be expressed as:

$$T_{ij} = A_i B_j O_i D_j f(c_{ij}) \quad (7.12)$$

and the balancing factors are defined as:

$$A_i = \frac{1}{\sum_j B_j D_j f(c_{ij})} \quad (7.13)$$

and

$$B_j = \frac{1}{\sum_i A_i O_i f(c_{ij})} \quad (7.14)$$

It is worth noting, however, that both A_i and B_j are mutually dependent which brings an added complication to the process of implementing the model. Nevertheless, Senior (1979) proposes an iterative algorithm which after setting either A_i or B_j to have an initial value of 1, solves each equation in turn, successively updating the balancing until convergence is reached and a set of

balancing factors are produced endogenously which ensure both origin and destination constraints can be satisfied.

7.2.3 Further Developments

To give the gravity based SIM a more theoretical basis, Wilson (1970) proposed the use of entropy maximisation. Entropy maximisation refers to an attempt to overcome the issue of not being able to explain why individuals undertake a particular trip (Khawaldah, 2012). Senior (1979) and Eyre (1999) provide more detailed reviews of this development. In summary, Wilson added an additional constraint relating to the cost of travel to be applied alongside the existing constraints. The entropy maximisation procedure ensures that amount spent on travel should not exceed the total amount of money that is available for travel. Many distributions of trips, in reality, satisfy the above constraints and this method of entropy maximisation verifies which of these distributions is most probable. Although the same applies to all of Wilson's models, as an example, the resulting production-attraction constrained model is given by the following equation (Wilson, 1970; 2010):

$$T_{ij} = A_i B_j O_i D_j \exp^{-\beta c_{ij}} \quad (7.15)$$

where

$$A_i = \frac{1}{\sum_j B_j D_j \exp^{-\beta c_{ij}}} \quad (7.16)$$

where

$$B_j = \frac{1}{\sum_i A_i O_i \exp^{-\beta c_{ij}}} \quad (7.17)$$

The equation is the same as the previous production-attraction or doubly constrained model (Equation 7.12) except that the distance function, $f(c_{ij})$ in that model is replaced here by a negative exponential distance function ($\exp^{-\beta c_{ij}}$). Additionally, β is the Lagrangian multiplier associated with the cost constraint equation and the balancing factors A_i and B_j ensure that the other two constraints (the production and the attraction constraints respectively) are met (Khawaldah, 2012).

Other, alternative derivations of the SIM have also been developed. For example, Wilson and Bennett (1985) proposed 'random utility' theory to replicate the choice process of individuals, and Pooler (1994) introduced 'information minimisation'. However, with regard to 'information minimisation', Eyre (1999) and Roy and Thill (2004) note that the use of prior information in

the model to improve performance makes future planning, where network or zone changes occur, highly problematic and thus unsuitable for the defined research. Those of more relevance to the retail sector include the ‘intervening opportunities’ model first introduced by Stouffer (1940) and the ‘competing destinations’ model presented by Fotheringham (1983). The work of Fotheringham (1983; 1986), was especially pertinent to the modelling of flows to standalone and/or clustered shops, arguing that the standard entropy model needed to be adapted to include a competing destinations term which recognises that outlets or centres in very close proximity to each other were really a single destination in the eyes of consumers (Birkin *et al.*, 2010). Other SIMs have also been proposed over time, but have been used outside the context of this research. Examples are the ‘two stages interaction’ model proposed by Liaw and Bartels (1982) and the ‘theory of movement’ developed by Alonso (1978) for migration.

In addition to these theoretical developments, it has become common place for modern SIMs to be disaggregated to account for more complex behaviour in a given system. Wilson (1971) initially made attempts to more accurately represent different behaviour in commuting to work through the disaggregation of the interaction model to represent different modes of travel. This produced a three dimensional model with the standard two dimensional origin by destination flow matrix being split over k modes of transport. Since then, this technique has been disaggregated or modified in accordance with different retail sectors and channels (Birkin *et al.*, 2004) or significant variations in the socio-economic characteristics of consumers (Khawaldah, 2012). Model disaggregation is an approach that will be adopted and expanded upon in this research, in order to resolve model development issues for the grocery sector.

7.2.4 Limitations and Alternative Methodologies

Despite the documented success both in academic research and commercial application, SIMs have a number of limitations which opens up the discussion for alternative methodologies. First of all, given that spatial interaction modelling became popular during the quantitative revolution, much of the early criticisms come from those commentators that support the more qualitative and humanistic approach to geographic research. The primary concerns were that quantitative methods associated with positivistic research did not include sufficient consideration of the philosophical underpinnings of the research (Unwin, 1992; Harvey, 1969), were too objective, lacked a consideration of agency and structure (Johnston and Sidaway, 2004; Cloke *et al.*, 1991), faced difficulties capturing irrational behaviours and complex psychology exhibited by humans (Bonabeau, 2002), and promoted the notion that a statistical relationship implied a causal relationship (Peet, 1998). Lee (1973: cited in Harris, 1994), in his ‘requiem of large-scale models’, was more directly critical of gravity based models, proclaiming

these ambitious models were nothing more than black boxes which were not based on soundly applied urban theory. In response, Harris (1994) stated that with respect to modelling, Lee's comments were short-sighted and ultimately mistaken due to advancements in technological innovation and developments in urban and land use theory. As such, the opinions surrounding quantitative geography are still somewhat divided, although it can still be argued that the quantitative revolution in geography played an important part in modernising what was a largely descriptive discipline (Holt-Jenson, 1999).

In addition to the more general critique of quantitative methods, the main criticism of SIMs using derivations of the gravity model is that they do not have an established theoretical base; instead they are based solely on an analogy with Newton's Law of Gravitation (Foot, 1981). For instance, Reilly's 'theory of retail gravitation' only gives the customer a choice of two destinations and thus has a limited focus on the theory of shopping behaviour (cited in Foot, 1981). Whilst Wilson (1971) addresses this to a certain extent through deriving the 'family of spatial interaction models' from first statistical principles, it is still a noteworthy point. Concern is also frequently raised over their aggregate nature and the fundamental inability to accurately represent the choice making behaviour of individuals. Again, as discussed in the previous section, this has been addressed to an extent through the disaggregation of the interaction model to incorporate the behaviour of different groups. Nevertheless, although more disaggregation in the models will provide a better representation of the real world, more detailed data are required in this case and it is difficult to accurately model the lower, more individual levels of interaction (Eyre, 1999). Openshaw (1976) also points out that disaggregation in the models will increase the relative importance of sampling errors as a result of the decrease in the size of the sample.

Spatial interaction models are also limited by more general geographical problems such as the Modifiable Areal Unit Problem (MAUP), the ecological fallacy and boundary effects (discussed in Chapter 4). Neither the MAUP nor ecological fallacy are specific to interaction modelling and have been providing problems for spatial analysts since they were first identified and outlined by a number of authors. In comparison, boundary effects are caused by modelling a system that is enclosed within a boundary but, in real life, that boundary does not form an effective divide. For example, in a given retail system, expenditure is not constrained by one catchment, but the model having no knowledge of any population outside the defined study region will not replicate these flows. The outcome is that any stores near the boundary edge will have unrealistic and normally very high levels of market share. To deal with this problem, Birkin *et al.* (2010) suggest a boundary-free approach for SIMs. However, this is a computationally intensive process and one that is beyond the scope of the proposed model.

Although associated more with the subject of retailing, the issue of data availability and quality is also fundamental to the construction and application of SIMs and can be divided into four main parts (Birkin *et al.*, 2010); demand estimations, supply estimations, the calculation of the impedance function and calibration. In regard to demand estimation, errors can occur due to poor quality data based on small sample surveys, the methodology used to calculate demand and whether the data includes recorded trips from visitors located outside the area. The latter can be particularly problematic if a store catchment is located within a holiday resort or a tourist destination (Newing *et al.*, 2013). In conjunction, errors in the supply data are normally due to the way that the attractiveness scores of shopping destinations are measured. Size and turnover have traditionally been used to measure the attractiveness of shopping centres as in the early models. However, it is known that other elements affect the attractiveness of a shopping centre such as brand, parking facilities, prices and consumer perceptions (Birkin *et al.*, 2010). In conjunction, the impedance function used to represent cost or the separation of the origin and destinations can take several forms and each one of them has its limitation; straight line distance (does not consider crossing environmental obstacles such as rivers), distance along a transport network (traffic and road speed are ignored) and travel time (generally preferred but expensive to acquire). The final source of data error links the last three issues and is that of observed flow data. For instance, in the retail sector, it is likely that firms would be very reluctant to divulge their own customer data. Conversely, even if one were to gain access to say Tesco's club card data, calibrating a model exclusively for one retailer's customers rather than the whole market could create a bias which may manifest itself in a parameter for other competitor types (Birkin, *et al.*, 2010). Equally troublesome are missing flows in the data and the way in which these are dealt with, as calibrating the model to a set of averages does not necessarily result in the correct patterns.

On account of the limitations discussed, many other researchers have opted to use alternative methodologies in retail planning instead of SIMs; these include gut-feeling approaches, analogue models, regression models, micro-simulation and agent-based models. Nevertheless, these techniques are also not without their range of problems. As such, the advantages and disadvantages associated with these alternatives are described in Table 7.1.

Table 7.1 Alternative methods to SIMs

Method	Advantages	Disadvantages
<p>‘Gut feeling’</p> <p>Gut feeling is the simplest of all the methodologies and involves a senior member of staff providing a ‘gut feeling’ for a location through a site visit.</p>	<p>Experienced individuals will usually have the ability to offer very good instinctive judgements on the performance of a potential store (Davies, 1977).</p> <p>Site visits are still required in conjunction with model estimates once a potential site has been chosen.</p> <p>Simkin (1990) emphasises that the gut-feeling approach was important and readily used by a variety of retailers even until the late 1980s in the UK.</p>	<p>The gut feeling approach is highly subjective and depends entirely on the experience of those making such decisions (Clarke, 1998).</p> <p>Very time consuming and expensive exercise. For those organisations with large-scale planned expansion programmes it may be logistically unfeasible to visit all possible sites in the time allowed.</p> <p>The increasing complexity of the retail scene makes it harder to make such simple predictions (Clarke, 1998; Eyre, 1999).</p>
<p>Analogue techniques</p> <p>Forecasting the potential sales of a new (or existing) store by drawing comparisons (or analogies) with other stores in the corporate chain that are alike in physical, location and trade area conditions (Clarke, 1998; Reynolds and Wood, 2010).</p>	<p>This is a trusted methodology in the retail industry. Analogue techniques were (and still are to an extent) also very common procedures for site location in the UK and US (Clarke, 1998).</p> <p><i>“(The) greater understanding of the way in which existing stores trade has been fed back into the sales forecasting process through an increased appreciation of analogue store performance.”</i> (Moore and Attewell, 1991:24)</p>	<p>Problems remain with the variable performance of stores across similar geographical markets. In reality, a wide variation in performance is frequently found between outlets in a retail chain (Eyre, 1999).</p> <p>Nearly impossible to find a sample of stores which have similar trading characteristics and catchment areas to make comparisons (see Ghosh and McLafferty, 1987).</p> <p>Similar approach to the analogue method has been to follow the behaviour of other (larger) retailers (e.g. Marks and Spencer, Boots) and base store location decisions on whatever decisions they make (‘parasitic’ approach) (Clarke, 1998).</p>
<p>Regression models</p> <p>Possible regression models include multiple regression, ordinary least squares, linear, log-linear, multi-level and geographically weighted.</p> <p>The most commonly used in retailing is multiple regression-works by defining a dependent variable such as store turnover and attempting to correlate this with a set of independent or explanatory variables (Clarke, 1998).</p>	<p>Regression techniques have been extensively used in the field of store revenue estimation (Lord and Lynds., 1981).</p> <p>Allow greater sophistication and objectivity than more manual analogue techniques (Clarke, 1998).</p> <p>Demonstrate impressive descriptive powers (through their ability to reproduce the variation in sales across a network (Timmermans, 1981).</p> <p>Flowerdew (2010) argues that they present a feasible alternative to traditional SIMs.</p>	<p>It is not necessary to differentiate between every single regression model in detail because, as we will see, they share similar drawbacks</p> <p>The basic feature of regression analysis which assumes that the explanatory variables in the models be independent of each other and uncorrelated. In many retail applications this is not the case – independent variables such as floor space and car parking spaces may be strongly correlated (Clarke, 1998).</p> <p>The so-called multicollinearity problem has received much attention in the literature (Lord and Lynds, 1981; Ghosh and McLafferty, 1987; Flowerdew, 2010).</p> <p>Retail sites have to be evaluated in isolation, without considering the full impacts of the competition or the company’s own global network (Clarke, 1998).</p>

		<p>Difficult to find a sample of stores which have similar trading characteristics and catchment areas (see Ghosh and McLafferty, 1987)</p> <p>Regression models fail to model the processes (spatial interactions) that generate the flows of revenue between residential or workplace areas and retail outlets.</p>
<p>Micro-simulation</p> <p>Used to investigate the impacts of social and economic policies on individual micro units such as people, households and firms (Ballas and Clarke, 2001).</p>	<p>The approach is aimed at resolving data aggregation problems by disaggregating data from aggregate to individual-levels. Therefore, it does not suffer the same aggregation problems associated with SIMs and other statistical techniques.</p> <p>The technique is particularly useful for combining and disaggregating spatial data sets in order to synthesise a population of individuals (Smith <i>et al.</i>, 2009)</p>	<p>Although micro-simulation works at the micro-level it is not possible to incorporate behaviour or intelligence into the micro-units.</p> <p>Detailed environmental components such as quiet streets or new urban development's cannot be incorporated (Malleon, 2010).</p> <p>The structure is inherently static and designed to represent a single point in time, predictions are enacted by tracking the ramifications of altering otherwise static variables (Clarke, 1998).</p>
<p>Agent-based models</p> <p>Not widely used in retailing but agent-based modelling is a bottom-up approach to understanding systems which provides a powerful tool for analysing complex, non-linear markets (Twomey and Cadman, 2002). The method involves creating artificial agents designed to mimic the attributes and behaviours of their real-world counterparts.</p>	<p>The system as a whole is not constrained to exhibit any particular behaviour. In particular, assumptions of linearity and equilibrium are not imposed on the system as they often are in the more common top-down modelling approaches.</p> <p>Allow us to introduce a very high degree of heterogeneity (diversity) into our populations of agents.</p> <p>Another flexible feature of agent-based-models is their ability to explicitly incorporate communication among agents (Twomey and Cadman, 2002).</p>	<p>Often argued to be over complex which can detract from understanding the dynamics of the component interactions at the heart of a complex system (Malleon, 2010).</p> <p>Agent-based models can be difficult to implement and small errors in the integral logic of the code can have huge effects on the outcome of the model (O'Sullivan and Haklay, 2000).</p> <p>It is an extremely computationally expensive technique (Axelrod, 1997; Bonabeau, 2002).</p> <p>Trying to capture the appropriate processes or mechanisms underlying the agents' behaviour may not be an easy task (Twomey and Cadman, 2002).</p>

7.2.5 Model Calibration and Goodness-of-Fit Statistics (GOF)

Model calibration involves the comparison of predicted flows to a set of observed flows in order to discover the value of model parameters (β in this case) which provide the best fit between the predicted and observed flows. The process of calibration is one of the most fundamental stages of model design; during calibration, the model-builder can develop a basic understanding of the model, explore its structure, test its sensitivity and identify any limitations of the model (Batty and Mackie, 1972). When calibrating a SIM, Batty and Mackie (1972) stated that there are two

important issues to consider. First of all, there is the problem of identifying an appropriate GOF statistic to measure model performance. Second, there is the issue of developing the best method with which to identify the best parameter values, which usually involves some form of optimisation task.

With regard to GOF statistics, there are number of possibilities that can be used to calibrate a given SIM. It is worth noting, however, because all SIMs (apart from the unconstrained model) have equations which are intrinsically nonlinear, that traditional calibration statistics used for linear models are not appropriate. To date, a number of detailed reviews exist on the various calibration statistics available (Batty and Mackie, 1972; Openshaw, 1973; Diplock and Openshaw, 1996; Harland, 2008); therefore only the most commonly used statistics and prevalent issues will be discussed.

A commonly used GOF statistic for assessing model performance is the Mean Trip Distance (MTD) (Stillwell, 1978; Dennett, 2010; Hamzah, 2012). The equation for the observed flow (MTD^o) can be written as:

$$MTD^o = \frac{\sum_{ij} T_{ij} d_{ij}}{\sum_{ij} T_{ij}} \quad (7.18)$$

and for the predicted flows (MTD^p) as:

$$MTD^p = \frac{\sum_{ij} \hat{T}_{ij} d_{ij}}{\sum_{ij} \hat{T}_{ij}} \quad (7.19)$$

MTD is often regarded as the most appropriate method for calibration when a SIM uses a negative exponential function for the trip distance or cost (Hyman, 1969; Batty and Mackie, 1972). Furthermore, models usually converge very quickly as calibration is reached when MTD^p is very close to MTD^o . However, it is often criticised for being a one dimensional statistic and it does not account for trip volumes in the matrix (Diplock, 1996). For example, in the observed data, there could be a number of long and short distances which would not be replicated when using the MTD for calibration.

Another possible statistic is the sum of absolute deviations between the model predictions and the observed values (Diplock, 1996). Essentially, this method compares the flows between zones for observed and predicted interactions and is written as followed:

$$f = \sum_i \sum_j |T_{ij} - \hat{T}_{ij}| \quad (7.20)$$

f is equal to the error, where T_{ij} is the observed interaction and \hat{T}_{ij} is the predicted level of interaction. The objective is to produce the lowest value of f as possible.

Additionally, it may also be decided that by minimising the sum of the squared deviations between predictions and observations, the best parameter values can be found (Openshaw, 1973; Diplock, 1996). This is calculated in a similar manner to Equation 7.20 but instead uses the square of the difference between observed and predicted flows:

$$f = \sum_i \sum_j (\hat{T}_{ij} - T_{ij})^2 \quad (7.21)$$

As with the sum of absolute differences, the model is calibrated when β produces the minimum value of f . Openshaw (1973) states that whilst other functions could be used for shopping model calibration, there are several inherent advantages to be gained by seeking a least squares solution. Additionally, in a study of calibration methods for retail models, Diplock (1996) concluded that of sum of squared deviations was the best GOF statistic because it behaves consistently over a range of parameter values and is relatively simple to implement.

The Standardised Root Mean Squared Error (SRMSE) is another variation of Equation 7.20; however in this case the square root of the sum of all errors squared is divided by the matrix dimension, with the resulting value divided by the average interaction value for standardisation.

$$SRMSE = \frac{[\sum_i \sum_j (T_{ij} - \hat{T}_{ij})^2 / m * n]^{0.5}}{[\sum_i \sum_j T_{ij} / m * n]} \quad (7.22)$$

where T_{ij} depicts the observed flows from origin i to destination j ,

\hat{T}_{ij} is the predicted flow between i and j , and

$(m * n)$ are the dimensions of the interaction matrix.

Knudsen and Fotheringham (1986) state that SRMSE should only be used when $\sum_i \sum_j T_{ij} = \sum_i \sum_j \hat{T}_{ij}$; however SIM usually meets this condition. SRMSE has a lower limit of 0 indicating

perfectly accurate predictions and an upper limit that is variable and depends on the distributions of the observed flows, although in practice it is often 1.

Finally, R^2 is one of the most commonly-used GOF statistics (Fotheringham, 1983; Clark and Ballard, 1980) and is formulated as follows:

$$R^2 = \left[\frac{\sum_i \sum_j (T_{ij} - \bar{T}_o)(\hat{T}_{ij} - \bar{T}_p)}{\left[\sum_i \sum_j (T_{ij} - \bar{T}_o)^2 \times \sum_i \sum_j (\hat{T}_{ij} - \bar{T}_p)^2 \right]^{0.5}} \right]^2 \quad (7.23)$$

where, \bar{T}_o represents the mean of T_{ij} 's and \bar{T}_p represents the mean of \hat{T}_{ij} 's. R^2 values range between zero and one. The closer the R^2 value is to one the better, since a value of one shows an exact correspondence between the observed and predicted flows, whilst a zero value reflects no correspondence. Despite being a popular GOF, several authors have noted that R^2 is relatively insensitive to variations in model specification and can yield artificially high values in GOF applications (Wilson, 1976; Harland, 2008). For example, Smith and Hutchinson (1981) reported values as high as 0.7 even when the observed and predicted values differed by 100 per cent.

In addition to those statistics mentioned, others which are more infrequently used include the Spearman's Rank Correlation Coefficient, the Chi-Squared statistic, Wilcoxon matched pairs signed ranks test and Absolute Entropy Difference (AED). However, these statistics are discounted based on their lack of sensitivity to model errors and long calibration time. As such, based on the evidence provided, for the purpose of this research, the sum of squares of errors will be used for calibration whilst the R^2 statistic (more intuitive than RMSE) will be used as a validation statistic to assess model performance.

The next step involves choosing a methodology for finding the correct parameter value that yields the least possible error in the predicted data. Diplock (1996) highlights three ways in which this can be achieved. First of all, one could apply a crude method of systematically recording the best results. This method is increasingly time-consuming as it involves the researcher imputing values by hand and running the model each time. Second, a given range of possible parameter values could be evaluated through a non-focused search to determine the lowest error. Again, whilst this would require no user input, it would be extremely time consuming as all possible combinations are evaluated. Third, a more focused and intelligent optimisation technique could be applied whereby an algorithm is utilised to search for the best

parameter value. Many different calibration algorithms have been developed and applied over-time, the most popular in SIM includes the Newton-Raphson iterative calibration method (Dennett, 2010), genetic algorithms (Heppenstall, 2004) and Fibonacci methods (Batty and Mackie, 1972). In practice, due to the exhaustive nature of the first two methods a more focused search routine is preferable to find the optimum β value and will thus be utilised in the preceding models (discussed in more detail in Section 7.4.3).

7.2.6 Application and Modelling in the Retail Sector

Since their introduction, SIMs have been applied across a number of disciplines, including migration (Stillwell, 1978; Dennett, 2010), education (Harland; 2008), journey to work patterns (Senior, 1979), retail location planning (Fotheringham, 1983; Birkin *et al.*, 2010; Thompson *et al.*, 2012; Khawaldah, 2012), the financial sector (Birkin *et al.*, 2004) and transport (Murad, 2003). Each application of SIMs has brought challenges, as each sector has presented its own specific characteristics and peculiarities.

In the context of retail planning, although retail conditions in the real world present a number of important challenges for shopping models, SIM has consistently proved robust enough to deal with these challenges. Subsequently, since the original pioneering work of Reilly (1931), Huff (1964) and Wilson (1971), SIM has been widely applied across a number of retail markets. For example, Khawaldah (2012) utilised a socioeconomically disaggregated SIM to assess the impact of Silverburn shopping centre on Glasgow. Birkin *et al.* (2004) introduced the concept of elastic demand into their SIM, a concept that replicates the increase in demand for a specific service in an area, if that service is introduced or increased. The theory is that increased access to a service will increase demand for that service, and the example used is the provision of cinema access. Eyre (1999) also had success demonstrating the benefits of using SIMs to estimate store performance for WH Smith and Toyota. Moreover, the work by Fotheringham (1983) (as discussed earlier) prompts an interesting discussion regarding the calculation of proxy attractiveness values for stores in retail modelling, and how these attractiveness values relate to consumer choice. For instance, Birkin *et al.* (2010) show how store choice is more complicated than the commonly used attractiveness proxy of store size and should attempt to incorporate other factors relating to brand perception, accessibility and store characteristics.

Whilst much of the academic literature has focused on the pedagogic evolution of these models in retailing, Birkin *et al.* (2010) also provide a comprehensive review of the applied use of SIMs in business. The use of retail shopping models in the private sector in the UK has increased hugely since the 1980s. Birkin *et al.* (2010) and Guy (1991) note that several major retail chains

(Tesco, Sainsbury's, Morrisons and Asda) now use the general SIM for predicting both the turnover of proposed new stores and the impact of these stores upon existing ones operated by the same company. Since the original work of GMAP Ltd, there has also been significant growth in the number of consultancy firms offering location planning and forecasting services using retail interaction models.

There a number of reasons which have caused this growth in the academic and commercial use of SIMs. First of all, there has been an increased use of Geographical Information Systems (GIS) in UK retail analysis. Retail planning is one of several fields that benefit from GIS applications as GIS can provide: market mapping (Birkin *et al.*, 2002); catchment areas identification (Thompson *et al.*, 2012); and the complex modelling of an entire retail network (Murad, 2007). Additionally, the environment of intense competition and diversification that surrounds modern day retailing now means that large retail corporations compete on a variety of platforms (price, channels, advertising and services) and location can be one way in which a retail firm can distinguish itself from its competitors and gain a competitive advantage. Effective location strategy is therefore essential for retail firms and when correctly specified and executed the SIM is well placed to help address such questions.

Despite the wealth of examples and application of SIMs across the retail sector, much of the academic literature has focused on the theoretical evolution of these models, as opposed to the practical issues of implementing them in different contexts, especially the grocery market. Birkin *et al.* (2010) believe there has emerged a parallel universe between academics who are continually interested in refining existing models or developing new approaches and practitioners who are attempting to adopt pragmatic approaches to solving government and business problems. As such, it is hoped that the following application of a disaggregated SIM in the food retail market provides evidence of a more applied use.

7.3 An Example Spatial Interaction Model System

The following section will illustrate the process for building both an aggregate and disaggregated SIM for the grocery sector. In both cases an example system is provided so to help transfer some of the literature and theory described in Section 7.2 into an applied example. The primary areas of discussion include the various components of a SIM, the differences between the two types of model and thus the rational for disaggregating a SIM.

7.3.1 The Aggregate Model

The basic singly constrained aggregate SIM used in retailing (Birkin *et al.*, 2002; 152) can be defined as follows:

$$S_{ij} = A_i O_i W_j \exp(-\beta d_{ij}) \quad (7.24)$$

where S_{ij} is the flow of people (or expenditure) from residential area i to grocery store j , O_i is a measure of demand (expenditure) in area i , W_j is a measure of attractiveness of grocery store j (in this instance), d_{ij} is a measure of the straight line distance between i and j , and A_i is a balancing factor to ensure that all demand is allocated to grocery stores within the region, written as:

$$A_i = \frac{1}{\sum_j W_j \exp(-\beta d_{ij})} \quad (7.25)$$

To understand how the model in Equation 7.24 would be applied, a theoretical example of a food retail market is provided in Figure 7.2.

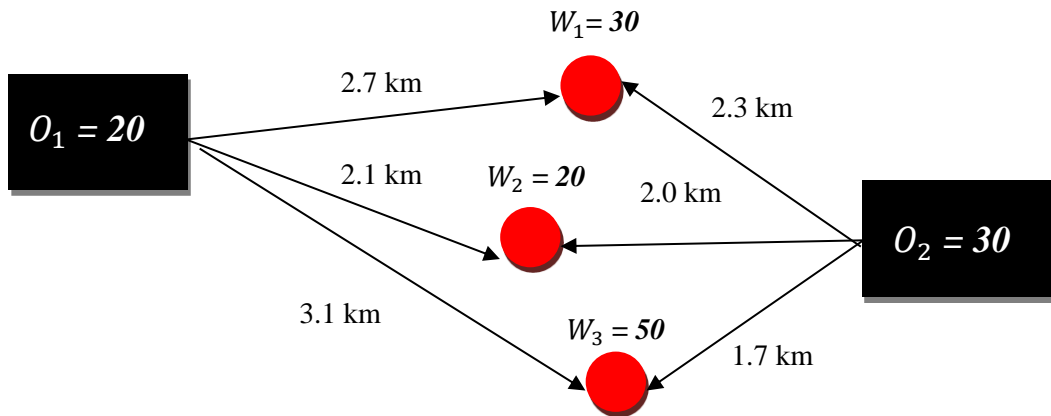


Figure 7.2. Hypothetical spatial interaction system (not to scale)

Source: Adapted from Harland (2008)

In this example, it is assumed that a given system contains two origins (O_1 and O_2) and three shopping destinations (W_1 , W_2 and W_3). The available demand from origin O_1 is £20 and from origin O_2 is £30, giving a total demand of £50 from both origins. The notional attractiveness for each of the three destinations is also set as 30 for destination W_1 , 20 for destination W_2 and 50 for W_3 . The distances between the origins and destinations are shown in kilometres.

Using the singly constrained aggregate model (as formulated in Equation 7.24), we can predict the flow of expenditure from each residential area i to each shopping destination j . The distance term $\exp(-\beta d_{ij})$ is a negative exponential function, with a parameter value of 1 for simplicity. To calculate the number of people who shop at destination W_1 from origin O_1 (for example), we first use Equation 7.24 to calculate the value of A_i as 0.01739. The equation for the interaction then becomes:

$$S_{11} = 0.01739 * 20 * 30 * \exp(-1 * 2.7) = 6.08 \quad (7.26)$$

This method is then applied to calculate each of the residence-grocery store flow pairs in the matrix. Table 7.2 shows the model results for the hypothetical retail system. The residential areas are represented by rows and the stores by columns. The last column shows the total flow of expenditure attracted by each of the three grocery stores from each residential origin which should equal the initial expenditure in each origin. The bottom row shows the total flows drawn by each store (which are not equivalent to the initial W_j values and the number of interactions in the system (in the final column).

Table 7.2. Matrix of prediction flows for the hypothetical grocery system

		Destination W_j			Total
		W_1	W_2	W_3	
Origin O_i	O_1	6.08	4.57	9.35	20.00
	O_2	8.36	5.92	15.72	30.00
	Total	14.44	10.49	25.07	50.00

It can be seen from Table 7.2 that due to the balancing factor A_i , the total expenditure drawn by all stores from residence zone O_1 is equal to the available expenditure in origin O_1 . The system also shows that the model results are relatively affected by the distance between the origins and destinations as well as the masses of each of the origins and destinations.

7.3.2 The Disaggregated Model

As discussed previously, whilst the aggregate model represents a useful means of understanding the flows within a given system, SIMs are often disaggregated to account for more complex human behaviour. More specifically, The S_{ij} term can be divided by consumer group (income or age), geography (urban/rural), product type (food or non-food) and channel/store format (convenience store and supermarket). If it is felt necessary, the disaggregation can occur across multiple categories. For example, breaking the flows down by three income groups, two age groups and two product types would form a total of 12 models. However, care should be taken when disaggregating by too many groupings because multiple models result in smaller flow

numbers for calibration – and thus poor performing models. Nevertheless, if undertaken correctly, there are clear benefits for breaking down the aggregate model. The principle reason is that different distance decay parameters can be assigned across the sub-models to take into consideration variations in the propensity to travel (Birkin *et al.*, 2010; Khawaldah, 2012). It is known, for example, that more affluent consumers travel further distances as they are more likely to own a car (Chapter 3). Equation 7.27 demonstrates a basic representation of the singly constrained model (Equation 7.24) for the grocery market disaggregated by customer type:

$$S_{ij}^k = A_i^k O_i^k W_j \exp(-\beta^k c_{ij}) \quad (7.27)$$

where S_{ij}^k is the flow of expenditure from residential area i to grocery store j by customer type k , O_i is a measure of demand (expenditure) in area i by customer type k , W_j remains the same as measure of attractiveness of grocery store j (although can be disaggregated if it is considered likely that different grocery stores will have different propensities to attract different customer types), d_{ij} is a measure of the straight line distance between i and j , and A_i^k is the balancing factor by customer type to ensure demand in each of the three models equals the sum of the final outputs:

$$A_i^k = \frac{1}{\sum_j W_j \exp(-\beta^k c_{ij})} \quad (7.28)$$

In order to provide an example of a disaggregated system, Table 7.3 displays an extended version of the food retail market from Figure 7.2 and Table 7.2. In this case, the model has been disaggregated by three consumer groups (a, b and c) to form three separate models. The variation in the β value is a reflection of the fact that a customer classified as type ‘c’ does not travel as far as type ‘b’ or ‘a’ when shopping for groceries. In addition to the β value, A_i also varies by consumer type ‘a’, ‘b’ and ‘c’ to balance each of the three models. Despite Table 7.3 only having a limited number of interactions, it is possible to see that the total flows to each of the stores (column totals) differs slightly to those in Table 7.2. This is brought about by the different beta values for each of the consumers – as distance is less of a limiting factor for consumer type ‘a’. However, similar to Table 7.2, the initial demand still adds up to the same total because of the role of the three A_i values in ensuring the overall constraint is satisfied.

Table 7.3. Matrix of prediction flows for the hypothetical disaggregated grocery system

	O_i	W_1	W_2	W_3	B	A_i	Total
O_{1a}	10	3.04	2.28	4.68	0.2	0.0174	10
O_{2a}	5	1.39	0.99	2.62	0.2	0.0147	5
O_{1b}	5	1.53	1.38	2.09	0.5	0.0394	5
O_{2b}	15	3.73	2.89	8.39	0.5	0.0262	15
O_{1c}	5	1.53	1.55	1.92	0.7	0.0674	5
O_{2c}	10	2.29	1.89	5.82	0.7	0.0383	10
O_1	20	6.10	5.21	8.69			20
O_2	30	7.42	5.76	16.82			30
Total	50	13.51	10.97	25.51			50

7.4 Disaggregated Spatial Interaction Model by 2001 Output Area Classification

The remainder of this chapter will follow the process of constructing and calibrating two regional SIMs disaggregated by different customer types – specifically using the 2001 OAC. One model will be produced for Yorkshire and the Humber, whilst the second will be based on data from London. Each model will be exactly the same in terms of its framework, differing only by the data in which it utilises. Initially, consideration will be given to the structure of the model, in particular the calculation of the attractiveness of grocery stores based on consumer (OAC) brand preferences. This is followed by an evaluation of the model inputs, the calibration of distance decay parameters, further calibration of model parameters to increase performance and an assessment on the overall performance of the model.

7.4.1 Model Framework

It is known from Chapter 6 that consumer behaviour in the grocery market is driven by a range of characteristics such as age, household size and income, all of which could have been chosen for the model disaggregation. However, bringing together multiple combinations of these variables in A SIM would have resulted in a large quantity of sub-models, thus making calibration problematic. Therefore, given the variety of variables included in the production of the 2001 OAC and the fact it also contains geographical information, disaggregation by the seven OAC supergroups provides a suitable choice. The seven sub-models will all have different β values to account for the varying propensities to travel amongst the seven OAC groups. Additionally, the W_j term will also be altered depending on the attractiveness of each

retail brand to each OAC supergroup. This is where the model is expected to provide a noticeable contribution to the literature, as most SIMs (aggregate and disaggregate) do not take into consideration the variation in retailers' profiles. For example, in a traditional model, locating a new Waitrose between a Sainsbury's and Iceland would result in an equal redistribution of demand (all things being equal) from both existing retailers to the new store. Nevertheless, it has been established in Chapter 6 that certain consumer groups (whether it be by age, income, household size or OAC) prefer specific grocery retailers. Therefore, in the proposed model, the new Waitrose would primarily impact on the Sainsbury's store (both attract more affluent consumers) as the majority of the more deprived households would still continue to shop at Iceland. Further discussion will be provided on the workings of the model in the following section, however the model equation can be written as followed:

$$S_{ij}^{kl} = A_i^k O_i^k W_j^{a_{kl}} \exp(-\beta^k d_{ij}) \quad (7.29)$$

where, S_{ij}^{kl} is the flow of demand between zone i and destination j for consumers of OAC type k and retailer type (brand) l , O_i^k is the demand in zone i by consumers of OAC type k , $W_j^{a_{kl}}$ reflects the attractiveness of brand l to consumers of OAC type k , $(-\beta^k d_{ij})$ is the distance decay parameter for consumers of type k multiplied by travel time from zone i to destination j . Finally, to ensure all demand is allocated, A_i^k is the balancing factor by OAC type k , calculated as:

$$A_i^k = \frac{1}{\sum_j W_j^{a_{kl}} \exp(-\beta^k d_{ij})} \quad (7.30)$$

7.4.2 Model Inputs

As stated, in order to construct a SIM, three types of data are needed; demand data, supply data and the distance/time between the residential areas (i) and grocery stores (j). First of all, demand is represented in the model by the total number of households in each origin. The number of households was chosen for demand over available grocery expenditure for a number of reasons. First of all, the data used to calibrate the model (Section 7.4.3) are recorded at the household level which provides an initial restriction. Moreover, as much of the thesis has been concerned with the 'switching' behaviour of consumers, the model will allow for further continuation of this narrative by highlighting the flow of different households to selected brands in each region. In terms of origin zones, Middle layer Super Output Areas (MSOAs) were chosen as the desired geography. This is because they form part of the suite of census geographies, which means the

Output Areas (OA) that contain the OAC codes are fully contained within this geography – making the disaggregation of demand much easier (see Chapter 4 on the benefits of using census geographies). As the smallest possible geography is often preferred when working with SIMs, it would have been preferable to use OAs. However, this would have presented small number problems in the calibration process, something recognised as major issue for SIMs by Birkin *et al.* (2010).

Consequently, the total number of households for each MSOA was extracted from the 2011 Census for Yorkshire and the Humber and London. This data was then divided up to produce the total number of households in each MSOA that fall within the various 2001 OAC supergroups. This can be represented algebraically as:

$$O_i^k = H_i^k \tag{7.31}$$

where O_i^k is the demand in each MSOA I and H_i^k represents the number of households in each MSOA by household type k (OAC).

The supply data (grocery stores) were acquired from GMAP Ltd’s extensive Retail Location’s list of grocery stores for GB (as described in Chapter 4). The variables required for the model included the location of the store (national grid coordinates of the store postcode centroid), the store brand, store format (e.g. Tesco Metro) and the store size (square foot). The national grid coordinates are needed to calculate the distance matrix in the SIM, whilst the other variables are necessary to produce attractiveness (W_j) values for each store. Birkin *et al.* (2010) provide a summary of the main drivers behind store attractiveness by each retail sector (grocery, non-food, automobile, finance and petrol). In the grocery market, the main factors which influence attractiveness are said to be space, parking, accessibility and price. Given that the GMAP data only contains store size and retailer brand, store size was used as the main attractiveness value (consistent with literature). It should be noted that only stores above 3,500 square feet were included in the model due to the complexities associated with modelling the convenience market. Additional factors were then included based on brand (regional loyalty), stores in city centres (benefitting from work-based populations) and stores in close proximity to other stores (agglomeration effect). As such, each store was given an overall (W_j) value between 0 and 100 through the production of a scorecard. Table 7.4 illustrates the weights associated with the different attributes to calculate the initial attractiveness value for each of the grocery stores in

Yorkshire and the Humber and London - formulated using a combination of the work by Birkin *et al.* (2010) and industry knowledge from GMAP Ltd.

Table 7.4. Scorecard for store attractiveness

Variable	Methodology	Weight
Store Size	Store size data provided by GMAP Ltd. Only stores 3,500 sq ft and above were selected for the model (scaled > 0 -100).	0.8
City Centre	All stores located within OAs termed 'city living' in the 2001 OAC (Yes = 100 and No = 0).	0.05
Agglomeration	Buffer analysis to find stores that have other stores within 100m (Yes = 100 and No = 0)	0.05
Regional Brand	$B_i^k = \frac{H_i^k}{F_i^k}$ where B_i^k is the brand attractiveness of retailer k in region i , H_i^k is the number of households in region i that shop at retailer k (taken from 2011 Acxiom aggregate data), and F_i^k is the total floorspace of retailer type k in region I (scaled between 0 and 100).	0.1
Overall Score	Example: Size + City Centre + Agglomeration + Brand Store 1 = (60 * 0.8) + (100 * 0.05) + (0 * 0.05) + (40 * 0.1) = 57	1

One of the most crucial parts of any SIM is the observed data used to calibrate the model (Birkin *et al.*, 2010). In this instance, the observed flow data were acquired from Acxiom's ROP. The ROP holds information on the location of the respondent, the brand of the main retailer in which that household shops at, and the location of that store. Even though the ROP data do not represent actual customer flows to individual stores, which could for instance be recorded through consumer store card data – there are advantages using this sort of survey data. More specifically, because consumer store card data refer exclusively to a company's own customers (rather than the whole market), bias in the client's data may manifest itself in a parameter which has to be used across all competitor types (Birkin *et al.*, 2010). As the ROP is designed to obtain information about all grocery retailers, the data do not contain this bias. The ideal situation would be to obtain actual customer data from all the major retailers. For example, Vroegrijk *et al.* (2009) used scanner purchase records from Gesellschaft fur Konsumforschung's (GfK) national household panel to track shopping behaviour before and after local hard discount entry in the Netherlands.

Despite the advantages of using the ROP for calibration, the data associated with the location of a respondents preferred grocery store varies in detail. For example, some respondents recorded the actual postcode of the store; others simply detailed the town or city it was in; and in most cases, no location is recorded at all. To use such a small sample of observed flows in the calibration of the model would have been problematic. This would have been exaggerated even

more so in the disaggregated model as the observed sample size decreases further. Consequently, a certain level of data preparation was required to improve the sample size. The first step involved cleaning the raw data recorded by the respondents in each region. This was easily done for those households which had listed their main retailer and the postcode or street name as the store location, as each respondent was assigned the grocery store (from the GMAP data) located in that postcode. However, for those which listed a town or city this was more difficult. In cases where their main retailer had only one store (e.g. Asda) in a given town, again the unique code for that store was assigned to that respondent. Alternatively, where there were two or more possible stores for a given retailer, the nearest was assigned. This was achieved using MapInfo Professional's 'distance calculator'. This tool allows the user to select a set of origins and destinations and allocate the closest destination to each origin. In this instance, the origins were OA centroids (to improve accuracy) and the destinations were the grocery stores for each retailer (postcode centroids) listed in the ROP. It must be stressed that the observed interactions only included consumers that detailed the retailer at which they shop. It seems reasonable to assume that if a household stated Morrisons or Lidl as their preferred retail store, it is likely that this would be the nearest Morrisons or Lidl outlet to that household. Using a OA to postcode lookup (geography of respondents from ROP), the nearest store (by brand) was then appended to the respondents from the ROP survey who had stated which retailer they use for their main shop, but had not specified the locality of that store. In order to increase the sample of interactions, ROP survey data were combined between 2011 and 2012 (three survey extracts, around 75,000 households in each region). This also meant that short-term shocks to the grocery market would not impact upon calibration. Finally, the cleaned flow data were then aggregated up to an MSOA (origin) – store (destination) matrix and separated out for the seven OAC supergroups to produce observed flows for each sub-model in the SIM.

Once the seven sets of observed interaction data had been constructed, it was possible to calculate the values for the distance/cost matrix which form the d_{ij} term in the model equation. As mentioned, it is preferable to use drive-time data when utilising a SIM, because it takes into account natural boundaries (e.g. rivers and mountains) and complicated road networks. Drive time data was acquired from Javelin Group; however the integration of the data into the SIM proved difficult. First of all, the data could only be provided for MSOA to MOSA interactions. This meant that additional data accuracy was lost with regard to the location of each store (recorded at postcode location). Secondly, because each of the models would be required to run scenarios at the regional level, there were problems extracting the large interaction matrices from Javelin Group – especially for London (too large). Finally, Khawaldah (2012) also demonstrates that there are only marginal improvements to be gained from using drive-time data for a retail model in Scotland. Consequently, it was decided that Euclidean straight line

distances would provide the most appropriate data, as used in SIMs by Kirk (2008) and Dennett (2010). It is felt that straight-line data will also provide more realistic flows in the regional model for London, as drive times in the city centre can be misleading (traffic). Therefore, a distance matrix in kilometres was calculated between the centroid of each demand zone (MSOA) and the centroids of each grocery store (postcode) using X and Y coordinates from the British National Grid. The calculation can be written as:

$$d_{ij} \sqrt{\frac{((x_j - x_i)^2 + (y_j - y_i)^2)}{1000}} \quad (7.32)$$

where d_{ij} is the straight-line distance, between origin zone (i) and shopping destination (j).

Finally, a $W_j^{a^{kl}}$ matrix was produced so to account for the attractiveness of different retailers to each of the OAC consumer groups in both Yorkshire and the Humber and London (Table 7.5). As stated, it is this functionality within the model that provides the greatest contribution to the literature surrounding the developments of SIMs. In reaching each of the defined matrixes in Table 7.4, a number of calculations were required. First of all, the percentage of households that shop at each retailer by OAC were calculated. This ultimately provided an estimation of the share each retailer has of the available households in each OAC – as demonstrated in Chapter 6. Similar to the observed flow data, so to produce more stable patterns, data were used from ROP surveys in 2011 and 2012. These ‘market share’ figures were then rescaled between a minimum of 1.0 and maximum of 1.1 for each OAC to retailer interaction so to standardise the data. Minimum and maximum values of 1.0 and 1.1 were defined as the (a^{kl}) parameter for each store were applied to the W_j figures as a power function. Thus, the potential effect could be quite high if increased/decreased too much. For instance, in the ‘city living’ sub-model for Yorkshire and the Humber, the W_j value (mixture of store size, agglomeration weight and regional brand weight) for all Waitrose stores would be raised to the power of 1.1 (increasing) the attractiveness, compared to the ‘constrained by circumstances’ model where it would be raised by 1.004 (barely increasing the attractiveness). The effect is that households termed ‘city living’ will be more attracted to Waitrose stores than the ‘Constrained by Circumstances’ households, as demonstrated in Chapter 6.

Table 7.55. $W_j^{a,kl}$ matrix for the disaggregated SIMS in Yorkshire and the Humber and London, 2012

Yorkshire and the Humber																
	Aldi	Asda	Budgens	Co-op	Farm Foods	Iceland	Lidl	Spar	Marks & Spencer	Morrisons	Netto	Sainsbury's	Sainsbury's Local	Tesco	Tesco Metro/Express	Waitrose
Blue Collar Communities	1.022	1.100	1.056	1.028	1.044	1.096	1.025	1.016	1.000	1.071	1.100	1.000	1.005	1.013	1.016	1.000
City Living	1.100	1.009	1.034	1.030	1.009	1.059	1.050	1.100	1.100	1.000	1.000	1.100	1.100	1.031	1.100	1.100
Countryside	1.054	1.000	1.000	1.100	1.013	1.002	1.100	1.040	1.019	1.067	1.002	1.052	1.000	1.100	1.001	1.020
Prospering Suburbs Constrained by Circumstances	1.051	1.042	1.029	1.000	1.000	1.000	1.000	1.000	1.035	1.069	1.002	1.084	1.010	1.035	1.000	1.026
Typical Traits	1.000	1.074	1.062	1.030	1.084	1.100	1.014	1.022	1.018	1.100	1.080	1.015	1.017	1.000	1.026	1.004
Multicultural	1.080	1.053	1.025	1.033	1.019	1.025	1.025	1.009	1.022	1.087	1.014	1.058	1.022	1.014	1.010	1.017
	1.095	1.060	1.100	1.000	1.100	1.067	1.098	1.021	1.021	1.058	1.063	1.043	1.037	1.015	1.045	1.016
London																
	Aldi	Asda	Budgens	Co-op	Farm Foods	Iceland	Lidl	Spar	Marks & Spencer	Morrisons	Netto	Sainsbury's	Sainsbury's Local	Tesco	Tesco Metro/Express	Waitrose
Blue Collar Communities	1.100	1.100	1.054	1.100	1.039	1.100	1.087	1.048	1.017	1.100	1.003	1.000	1.059	1.034	1.002	1.000
City Living	1.046	1.013	1.094	1.060	1.083	1.011	1.064	1.086	1.100	1.035	1.003	1.098	1.100	1.000	1.100	1.100
Countryside	1.000	1.000	1.000	1.000	1.000	1.090	1.000	1.000	1.000	1.000	1.100	1.039	1.000	1.100	1.000	1.089
Prospering Suburbs Constrained by Circumstances	1.059	1.003	1.049	1.031	1.046	1.000	1.057	1.024	1.050	1.071	1.000	1.100	1.081	1.032	1.006	1.061
Typical Traits	1.076	1.087	1.024	1.085	1.053	1.072	1.076	1.100	1.036	1.099	1.004	1.021	1.068	1.028	1.016	1.007
Multicultural	1.069	1.026	1.057	1.070	1.027	1.014	1.056	1.037	1.041	1.054	1.007	1.069	1.075	1.049	1.015	1.039
	1.084	1.072	1.100	1.089	1.100	1.076	1.100	1.075	1.041	1.065	1.006	1.050	1.071	1.018	1.038	1.016

Sources: Acxiom Ltd (2011, 2012)

7.4.3 Model Calibration and Goodness-of-Fit

In general, the calibration procedure involves producing a model that can best predict flows, based on a matrix of observed flows; in this case the model needed to accurately predict the flow of households from MSOAs to grocery stores across all of the seven sub-models. Consequently, two regional models (Yorkshire and the Humber and London) were calibrated using the flows produced in Section 7.4.2. The calibration process begins by choosing the appropriate method for finding the best parameter values that yield the best match between modelled and observed data. Based on the literature review in Section 7.2, it was decided that the sum of the squared deviations between the predicted and observed data (see previous section) would produce the most accurate β parameter (Openshaw, 1973; Diplock, 1996). More specifically, the β values for each of the seven models were altered until the smallest sum of the squared deviations figure could be produced. Rather than do this manually, an algorithm was devised and written in Visual Basic for Applications (VBA) for each model – the code is presented in Figure 7.3. The algorithm works as in a decision tree process by changing the β value up or down until the lowest sum of the squared deviations could be produced. It was found that a minimum of ten iterations was required to get a β value of sufficient accuracy.

This subroutine alters increases/decreases the beta value in a structured way to find the best model fit.

```
Sub CalculateBeta_OAC1()
```

```
    'Declare variables
```

```
    Dim lower As Double
    Dim upper As Double
    Dim middle As Double
    Dim Z_upper As Double
    Dim Z_lower As Double
    Dim i As Integer
    Dim iterations As Integer
```

```
    Dim YesOrNoAnswerToMessageBox As String
    Dim QuestionToMessageBox As String
```

```
    'Set the maximum and minimum beta values
```

```
    upper = 1
    lower = 0
    middle = (upper + lower) / 2
```

```
    'Set the beta initially to 0.5
```

```
    Worksheets("Calibration_OAC1").Range("F2").Value = middle
```

```
    'The number of iterations to run through (manually changed in the Excel sheet
```

```
    iterations = Worksheets("Calibration_OAC1").Range("K4").Value
```

```
    'Keep looping through until the number of iterations is reached
```

```
    For i = 1 To iterations
```

```
        Worksheets("Calibration_OAC1").Range("K5").Value = i
```

```
        Worksheets("Calibration_OAC1").Range("F2").Value = upper
        Z_upper = Worksheets("Calibration_OAC1").Range("F3").Value
```

```
        Worksheets("Calibration_OAC1").Range("F2").Value = lower
        Z_lower = Worksheets("Calibration_OAC1").Range("F3").Value
```

```
        'If the sum of the squared deviations is less than it was before then change direct the change upwards (e.g. lower increases)
```

```

If Z_upper < Z_lower Then
    lower = middle
Else
    'If the sum of the squared deviations increased then reduce the beta
    upper = middle

End If

'Set the beta value to the middle of the upper and lower values
middle = (upper + lower) / 2

'Start the loop again
Next i

'On completion display the results on a message box
MsgBox "Beta = " & lower & vbNewLine & _
    "Z = " & Z_lower & vbNewLine & _
    "R2 = " & Worksheets("Calibration_OAC1").Range("F4").Value, vbOKOnly, "FINISHED..."

End Sub

```

Figure 7.3. Automatic search routine for calibrating model beta values (OAC1 example)

Table 7.6 demonstrates the final β figures, produced after limiting the sum of squared errors for the models in both regions. In order to provide context, statistics are also detailed for an aggregate model within each market. The aggregate SIM was produced in the same way as the disaggregated model; however it did not include the $W_j^{a^{kl}}$ functionality (not disaggregated by OAC). It should be noted that the β value for the ‘countryside’ model in the London market was calculated based on the relationships between the β values from the Yorkshire and the Humber model. There are only a few OAs that fall within this classification in London which meant the sample size for this customer group was too small to calibrate β . On observing Table 7.6, there is a distinct variation amongst the different OAC supergroups with regard to the propensity to travel. For example, in Yorkshire and the Humber, the ‘countryside’ and ‘prospering suburbs’ groups have the lowest β values compared to the ‘constrained by circumstances’ and ‘multicultural’ groups. This fits with literature in Chapter 3 which states that wealthier and more rural customers travel furthest to shop. A similar pattern is seen in London; however the β values are much higher (lower MTD). This is arguably because there is a greater supply of stores in the region, more people depend on public transport and London is far more urbanised. The resulting impact is that store catchments in London will be much tighter, as distance is more of a deterrent. Interestingly, despite the contrasting literature on calibration statistics (Section 7.2), using the sum of squared errors to calibrate the β figures often produces very similar observed and predicted MTDs.

Table 7.66. Mean trip distances and β paramaters

	Yorkshire and the Humber			London		
	β	Observed MTD	Predicted MTD	β	Observed MTD	Predicted MTD
Aggregate Model	0.669	3.29	3.27	0.861	2.44	2.44
Blue collar communities	0.535	3.72	3.53	0.712	3.21	2.83
City living	0.691	2.75	2.74	0.966	1.91	1.51
Countryside	0.442	6.98	8.64	0.751	N/A	4.26
Prospering suburbs	0.525	3.84	3.84	0.828	2.51	2.46
Constrained by circumstances	0.671	2.85	2.84	0.801	2.56	2.48
Typical traits	0.552	3.72	3.72	0.775	2.89	2.86
Multicultural	0.791	2.12	2.11	0.943	2.10	2.09

It is noted that whilst search routines and systematic approaches can be used to calibrate a SIM, Birkin *et al.* (2010) believe the calibration process is an art as much as it is a science. Therefore, on the production of the β figures for each of the OAC models in both regions, further adjustments were required to increase the performance of the model. However, rather than make adjustments to the individual attractiveness of each store, the final amendments to model parameters were done in a systematic manner. First of all, the brand weights (B_i^k in Table 7.4) were altered for each of the brands to help align observed and predicted ‘market shares’ for each retailer (after totalling flows to each store). For example, in some cases the model was either over or under-predicting the market share for different retailers. Therefore, the brand weights were increased or decreased accordingly (marginally) to bring the observed and predicted figures closer together. The final observed and predicted ‘market shares’ for each of the regions are displayed in Figure 7.4. The observed market share figures are from the 2011 Acxiom Aggregate Data (AD), which provide the total number of households that shop at each retailer within each of the study areas. It is evident that both of the regional models are capable of predicting an accurate proportion of households to each brand. This is reassuring and strengths the forecasting power of the model with regards to any analysis in Chapter 8. Whilst, there are some slight deviations, the model was able to produce predicted flows to each brand within 95 per cent (GMAP Ltd note the accepted industry standard is around 80 per cent) of the observed flows.

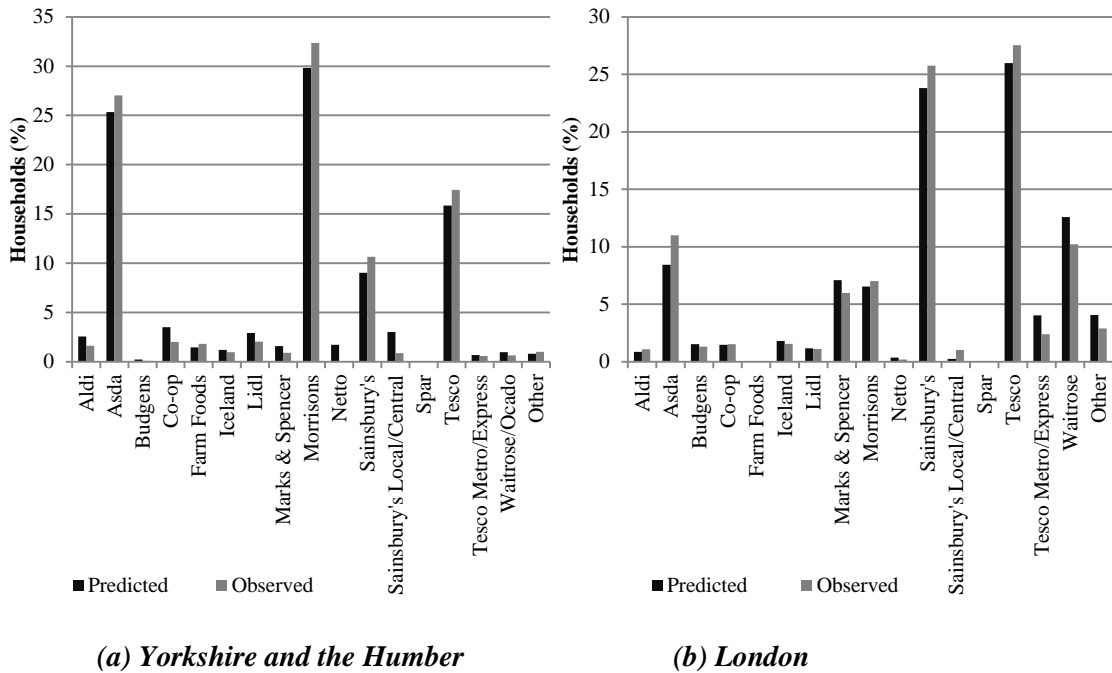


Figure 7.4. Observed and predicted 'market share' by brand

Source: Acxiom Ltd (2011)

In addition to the brand weights, the values in W_j^{akt} matrix (Table 7.5) were also adjusted to bring the predicted consumer profiles for each retailer in line with those from the observed ROP survey data. As this functionality is a major contribution to the literature regarding SIMs in retailing, it is crucial that the model in both regions can reliably recreate the observed customer profiles for each of the retailers. Figure 7.5 displays the observed and predicted customer profiles for the main retailers discussed throughout this thesis for both regions. On observing the distributions, strong comparisons can be made between the observed and predicted profiles of the consumers. This would suggest the OAC sub-models in each of the regions are calibrated sufficiently to produce accurate customer flows to each of the modelled brands. The data also highlight the regional differences in demand between Yorkshire and the Humber and London – strengthening the argument that store location strategy is a complicated process and regional differences in consumer demand are of paramount importance (Birkinet *al.*, 2002; Thompson *et al.*, 2012).

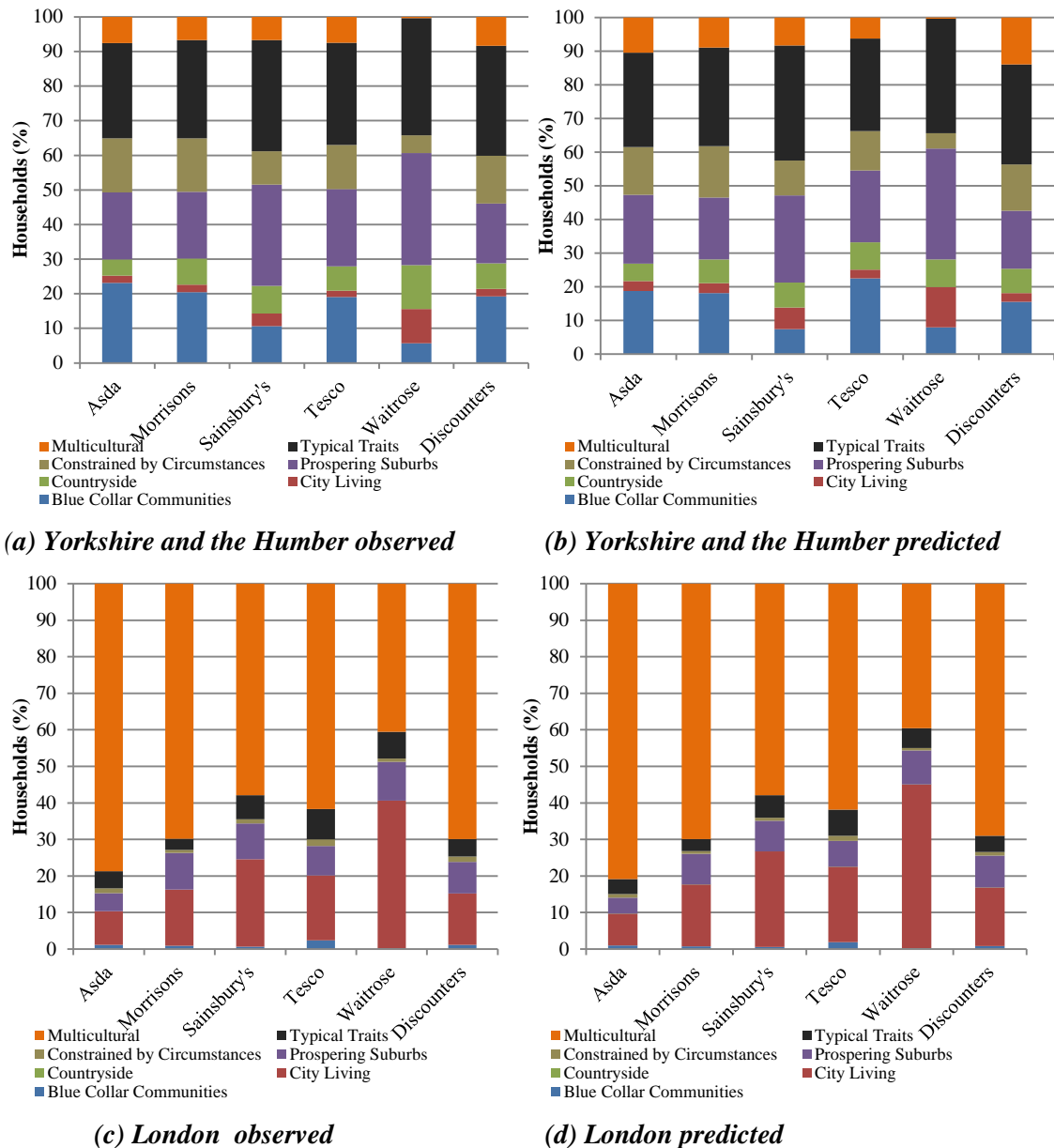


Figure 7.5. Observed and predicted ‘market share’ for each of the calibration regions

Sources: Acxiom Ltd (2011-2012); GMAP Ltd (2012)

Building on the reliability of the model to predict brand level flows, R^2 statistics are provided in Table 7.7 to demonstrate the GOF of the final model in either region (Table 7.6). Additionally, figures are also provided for the aggregate model to demonstrate the benefits and ultimate improvements associated with disaggregating a SIM. The R^2 values highlight the overall performance of the model in terms of the matrix of flows. The figures illustrate that disaggregating the SIM by OAC increases the overall R^2 (in terms of MSOA – store flows) from 0.731 to 0.801 in Yorkshire and the Humber and 0.711 to 0.788 in London. This can be accredited to the variation in the β parameters by OAC to account for the different propensities to travel. The aggregate model treats all households the same which averages out the trip distances, impacting on the overall performance of the model. Contrasting the results in each region, the SIM for Yorkshire and the Humber is found to produce more accurate results (in

terms of replicating observed data) than London. This would have been expected given the complicated nature of the grocery market in London – there is increased competition, smaller store formats, consumers have greater access to public transport and are likely to undertake shopping trips closer to work (ROP captures residential to store trips only). In terms of the various sub-models, the R² values differ by OAC supergroup. The figures illustrate that the ‘city living’ and ‘countryside’ models are the most difficult models to calibrate – this is arguably a result of the geographic extremes in trip distances at work. For example, the ‘countryside’ supergroup will contain a selection of remote consumers that will need to travel long distances to the nearest grocery store. Moreover, the ‘city living’ supergroup is associated with households that have both high disposable income (literature suggests increased mobility) yet live in the city centre where there is an increased supply of stores (less likely to travel long distances). The conflicting behaviour of these consumers is thus likely to cause problems for calibration.

Table 7.7. SIM goodness-of-fit statistics

	R ²	
	Yorkshire and the Humber	London
Aggregate Model	0.731	0.711
Blue collar communities	0.831	0.731
City living	0.718	0.697
Countryside	0.681	N/A
Prospering suburbs	0.768	0.727
Constrained by circumstances	0.826	0.746
Typical traits	0.738	0.761
Multicultural	0.853	0.845
Disaggregate Model	0.801	0.788

Finally, and most importantly, to ensure that the assumptions and forecasts made in Chapter 9 are realistic, it is useful to map the geographic flows estimated by the SIM against those occurring in reality at the store level. Similarly to Thompson *et al.* (2012), the predicted market share values are compared to a set of observed data in Figure 7.6. In this case the observed and predicted flows (percentage of households) are produced at MSOA level for Tesco supermarkets in Leeds. On reflection, the maps demonstrate a consistent pattern, with the highest percentage of households concentrated around the Tesco stores. This highlights the power of SIMs in terms of producing accurate low-level market share estimates. In conjunction, Table 7.8 exemplifies the performance of each regional model in terms of how accurately it predicts the flow of households to individual stores. For example, 1 would be a perfect match (observed = predicted). GMAP Ltd claims that an accepted industry standard for predicting individual store performance is an error of around 20 per cent (0.8-1.2). After applying this threshold to the stores in each of the regions, Table 7.8 illustrates that the Yorkshire and the Humber model

achieves this for over 87 per cent of outlets compared to 80 per cent in London. This is reassuring, for there is little point calibrating a model to produce favourable GOF statistics if the final outputs (model flows) are unrealistic.

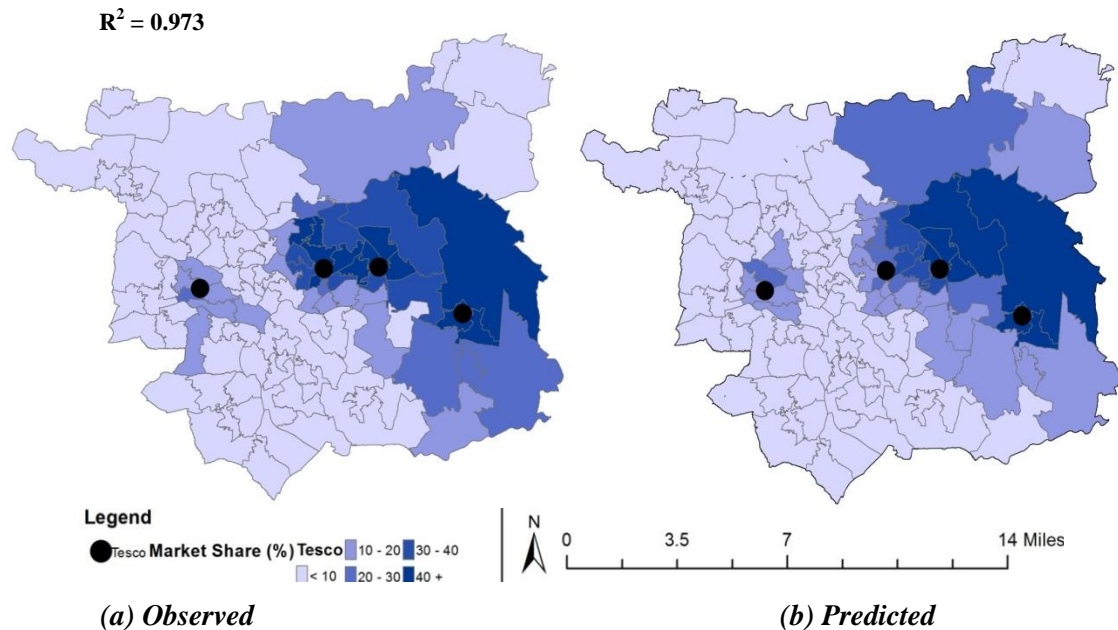


Figure 7.6. Observed and predicted flows for Tesco supermarket stores in Leeds, 2012

Sources: Axiom Ltd (2010-2012); GMAP Ltd (2012)

Table 7.8. SIM goodness-of-fit statistics

Percentile		Stores (%)	
Max	Min	Yorkshire and the Humber	London
	< 0.7	3.1	6.4
0.7	0.8	2.1	4.8
0.8	0.9	19.5	19.6
0.9	1	29.2	22.0
1	1.1	25.0	20.5
1.1	1.2	14.1	18.6
1.2	1.3	2.7	3.2
1.3	+	4.3	4.9
Total (%)		100	100

Taking everything into consideration, there is no doubt from the outputs (convergence of MTDs, brand level market share, OAC-brand profiles, GOF statistics and individual store performance) that the defined SIM provides a useful mechanism for assessing the performance of retailers in the British grocery market. Consequently, confidence can be given to the use of the SIM as a location planning tool in the final chapter, which evaluates opportunities for growth in the discount grocery market.

7.5 Conclusion

This chapter has attempted to provide a modelling framework that integrates the interactions between demand (consumers) and supply (stores) in the British grocery market. This has been achieved through the construction and calibration of a disaggregated SIM in two comparison regions, Yorkshire and the Humber and London.

Initially, so to provide context, a complete historical review of the advancements in SIMs was provided in Section 7.2. Particular areas of focus included the theory underpinning SIMs (Newton's law of Gravitation), different refinements that have been made over time, the process of calibration, alternative methodologies and the application of the SIMs in retailing. An example system was then provided to transfer some of the theoretical discussion in into a more practical setting. In this instance the differences between aggregate and disaggregate SIMs were examined, highlighting the benefits associated with creating a series of sub-models for modelling the flow of demand the grocery market. The remainder and most substantial part of the chapter then focussed on building, calibrating and testing two regional disaggregated (by OAC) SIMs for use as planning tools in the British grocery market. Initially, considerations were given to the model framework and its contribution to the literature surrounding the development of SIMs. The primary advancement was argued to be the incorporation of a consumer - brand relationship which makes certain stores (depending on its brand) more attractive to specific consumers (OAC). The resulting impact is believed to be more accurate revenue forecasts should the model be used for estimating opportunities for growth in GB. Model inputs were also discussed, highlighting the use of a unique commercial dataset to calibrate the model (Acxiom's ROP). The data offer considerable advantages over traditional sources of retail interaction data, as they provide the chance to calibrate flows across all brands in the market. Additionally, outputs from the calibration of distance decay parameters also illustrated the varying trip distances undertaken by different consumers by OAC – especially between Yorkshire and the Humber and London. This reinforced the need to move away from the more aggregate SIMs so that the variations in consumer behaviour can be captured more accurately. Finally, once the calibration process had been examined, a range of model outputs exemplified the precision of the model in terms of producing regional market share estimates, customer profiles by brand and low-level spatial catchments for individual outlets. The combination of these results and favourable goodness-of-fit statistics emphasised the strength of utilising SIMs as location planning tools in what is a complex, highly competitive and uncertain (from an economic perspective) market.

Chapter 8

Scenario Building: Opportunities for Growth in the British Food Retail Market

8.1 Introduction

The previous chapter involved the process of constructing a disaggregated Spatial Interaction Model (SIM) for two regions in the British grocery market. By using observed interaction data from Acxiom's Research Opinion Poll (ROP), the model was calibrated to produce reliable market share estimates and customer profiles for each of the modelled retailers. Consequently, this final analysis chapter will look at utilising the SIM to predict the performance of retailers moving forward into an era of recovery in Great Britain (GB). More specifically, given the documented success of the discounters and their ambitious growth plans over the next decade, the model will be used to assess potential locations for Aldi, the discount company looking to break the 500 store mark in 2013. However, it remains to be seen whether this can be achieved and what will be the overall impact on the other retailers in the market. For example, taking into account the saturation debate, the question is whether there is still room for expansion in traditional and well established markets where the discounters already have a relatively high market share. If so, this would require identifying concentrations of customers that are currently not being served by the discounters. Furthermore, given the changing consumer profile of the discount retailers since 2005 and more dramatically since the recession began, the question is whether this has opened up new areas of growth which previously would have been unprofitable.

The following chapter will therefore provide a detailed process for locating new Aldi stores in two comparative regions. The chapter will begin (Section 8.2) with providing initial details on Aldi and its ambitions for growth over the next decade, along with a rationale of the store location methodology to be used in the remainder of the chapter. Thereafter, Section 8.3 will explore the opportunities for growth in Yorkshire and the Humber, an area where Aldi have already established a strong market share in relation to the rest of the country. Section 8.4 will examine the potential for growth in London, a region acknowledged as a key area for growth by

both Aldi and industry experts over the next five to ten years (CACI, 2011; Thompson *et al.*, 2012; Hughes, 2013). Each section will start with market share estimates for the two regions before moving into more detailed site location research. Next, the findings from Chapter 5 (store networks) and Chapter 6 (retailer profiles) will be revisited as a way to assess market potential in each of the study regions. Potential locations for new Aldi sites will be explored based on the concentration of selected consumer types using the 2001 Output Area Classification (OAC) – a similar technique to that reported in Thompson *et al.* (2012). Once various sites have been identified, the SIM developed for each region in Chapter 7 will be used to assess whether the locations are likely to produce favourable results. Reflections are then provided in a penultimate section on the performance of the model and additional scenarios in which the SIM could be utilised.

8.2 Site Location Research for Aldi

There is little doubt that the current decade will continue to be a challenging period for retailers in GB. Recession, the threat of market saturation, planning guidelines and a range of environmental pressures are forcing companies to look for evermore effective ways to reduce costs, maintain margins and increase their competitive advantage. As a result, much like in the 1990s, it is against this multitude of pressures that locational issues are once again taking on a greater significance (Bennison *et al.*, 1995; Birkin *et al.*, 2010). Furthermore, it must be recognised that site location strategies are not merely the question of choosing random sites; they also involve the juxtaposition of the spatial characteristics of the market with the overall corporate and market goals of the firm.

8.2.1 Aldi

One of the major themes to emerge from this thesis has been the recent success of the discount grocers. Since the start of the recession, Aldi, Lidl and the former Netto have performed well, increasing their market share to record levels. The discounters have benefitted from consumers trading down, attempting to get more for their money as inflation has pushed up the price of the average food basket. A similar trend happened in the 1990-93 recession, as the economic downturn meant consumers faced similar strains in managing their household budgets. All three discounters managed to increase their market share, targeting in particular the more deprived consumers in the market. However, as the economy recovered, many consumers reverted back to the major retailers which meant the discounters growth slowed somewhat in the late 1990s and early 2000s. Nevertheless, it is believed that this time around the success of the remaining discounters is likely to continue – and the worry for the ‘big four’ (Tesco, Sainsbury's, Asda and

Morrisons) is that they may not be able to entice customers back when the economy fully recovers.

Demonstrated by the findings in previous chapters, the recession has undoubtedly driven growth for Aldi and the other discounters by providing favourable trading characteristics, as households on higher incomes have even started trading down to the discount format. This wealthier consumer base (see Chapter 6) has helped Aldi immensely as the company made a pre-tax profit of £57.8 million and turnover grew by nearly 30 per cent to £2.76 billion in 2011 – pushing its share of UK grocery spending to a record 3.1 per cent (Kantar Worldpanel, 2013). Nevertheless, it should also be noted that the retailer's aggressive store expansion program over the last five years has also extended Aldi's reach to a greater variety of consumers (Chapter 5). Looking to capitalise on its surge in market share since 2007, Aldi has plans to create 4,500 jobs in Britain in a £180 million expansion that will see it build 40 stores by the end of 2013, taking it through the 500 store mark (Kollowe, 2012; Hughes, 2013). It is believed that this will be followed by a plan to double its UK stores over the next ten years (Felsted, 2012; Thompson *et al.*, 2012).

In addition to investing in its store networks, Aldi has also been acclaimed for its operational methods which led to it being crowned 'Grocer of the Year' in 2013 (Yeomans, 2013). For instance, the limited ranges Aldi offers ensures it can maintain quality, keep price low and sell on a 'when-it's-gone-it's-gone' basis. Buying in bulk (economies of scale) means the company also maintains good relationships with its suppliers (Creevy, 2010; Kollowe, 2012). Aldi also has a tradition of keeping things simple. Its no-frills stores are basic and have a market-like feel so as to create an informal shopping experience (Creevy, 2010). Another cost-led procedure was the decision to charge customers for carrier bags; something now considered to be a green alternative, although Aldi has been doing this for years. Again, whilst Tesco and the major retailers benefit from first mover advantages, Aldi have actually demonstrated 'last mover' advantages over the years – absorbing the lessons learnt by other retailers before it. For example, it did not have scanners until 2001 as employees were expected to memorise the price of products. This later installation meant Aldi waited and picked the right system, and consequently now has one of the most state-of-the-art scanning systems of all the grocers (Creevy, 2010). Aldi has also been extremely original with its promotions on groceries, coming up with the idea of weekly non-food promotions, usually in the centre of its store. Moreover, aiming to capitalise on its recent success, it was the only grocer to increase its advertising spending in 2012 (Lawson, 2013). In conjunction, whilst in-store staffing is not a major priority, Aldi places an obvious emphasis on graduate recruitment. Its graduate training scheme is ranked third in the 'The Times Top 100 Graduate Employers' in the UK.

Taking all of this into consideration, it is not surprising that industry professionals believe Aldi will remain a threat to the other retailers in the market as they continue to show strong signs of growth even as the market begins to recover (Thompson *et al.*, 2012; Kollowe, 2012; Hughes, 2013). Despite struggling in 2010 and regardless of fears by other retailers over market saturation and stagnation (Tesco), growth in GB remains very much on the agenda for Aldi.

8.2.2 Store Location Strategy

The recent success of the discounters (especially Aldi) on the back of the recession in GB has been widely documented in trade journals, in the news and in a handful of academic papers. However, little has been reported on the potential expansion of the discount grocers and how they might capitalise on this success moving forward. Therefore, the remainder of this chapter will follow a specific store location strategy for locating new Aldi stores in GB. In the academic literature, a store location strategy is defined as the planned physical expansion of a retail chain that meets the prescribed company growth objectives (Bennison *et al.*, 1995). Therefore, whilst the chapter will be primarily focused on the success of new Aldi stores, attempts will be made to ensure the recommendations are ones that best represent the company's objectives.

One way in which the location strategy will be focused around Aldi's future ambitions is through the regions in which the site location research will take place – Yorkshire and the Humber and London. In relation to Aldi, each region provides an interesting comparison with regard to the retailers' store location strategy moving forward. For instance, Yorkshire and the Humber, an area where Aldi already has an established store network (see Chapter 5), has been earmarked as one of its key markets in GB. In the coming years, Aldi aims to add five new stores to the region, describing Yorkshire as being an area where store sales commonly outstrip the majority of other counties around the UK (Yorkshire Post, 2010). Therefore, it will be interesting to see (in relation to the saturation debate) if there is still room for Aldi to expand in one of their traditional heartlands or whether the discounter needs to start locating elsewhere. In comparison, it is argued that London presents the greatest opportunity for discount grocers (Mail Online, 2008; Thompson *et al.*, 2012; CACI, 2011). This is because it is an area where they currently have few stores (see Chapter 5) but where many of their target customers reside. Given the profile of the customers in London (increased wealth), the potential expansion into the region moves the focus of the company from deep discounting to serving more middle markets (a potential change in the value-platform growth strategies), a strategy which companies such as Aldi and Lidl now seem to be championing.

In order to identify the optimum locations for Aldi, the defined store location strategy will be one which is adhered to both in industry (Birkin *et al.*, 2002; 2010; CACI, 2011) and the academic literature (Bennison *et al.*, 1995; Thompson *et al.*, 2012; Newing *et al.*, 2013).

Initially, geodemographic analysis undertaken in Chapter 6 will provide a key component to identify potential new sites for Aldi in the two selected regions. Geodemographic analysis has a long history of application in site location research (Birkin *et al.*, 2002; Thompson *et al.*, 2012; Newing *et al.*, 2013) on account of the fact that it provides a useful tool in profiling the target audience for retailers. Once the primary customers for Aldi have been identified in each of the study areas, these will then be mapped out to expose their spatial distributions. Given the variations in the types of customers in each region, this will be specific to both Yorkshire and the Humber and London, the rationale being that if Aldi can locate in new areas which contain similar consumer profiles to their existing stores, it stands to attract a good customer base.

The geodemographic analysis will then be supplemented by more detailed revenue forecasting and generation of localised market share figures for potential locations. Single site assessments will be provided along with multiple sites scenarios where all of the recommended sites are run together. The functionality of the model will also highlight the potential impact on competing retailers and the customer penetration of the new stores in each region. The inputs of the SIM will remain as they did for each model in Chapter 7, and will be run for the entire region. This will help reduce the impact of boundary effects (Birkin *et al.*, 2010), a known problem when using SIMs. It is understood that whilst this will not completely eradicate the problem, it will be an improvement on the work of Thompson *et al.* (2012) who model with much smaller catchments.

In order to provide more accurate market share figures, the total number of households travelling from each Middle Layer Super Output Area (MSOA) i to a given store j will be multiplied by corresponding expenditure figures as it is known that expenditure varies by OAC (Chapter 6). More specifically, on running the model, the total number of households (by OAC) are multiplied by their corresponding average OAC/retailer grocery expenditure to produce total weekly spend on groceries in each MSOA:

$$O_{ij}^k = H_i^k * \bar{G}_i^{kl} \tag{8.1}$$

where O_{ij}^k is the expenditure in MSOA i , flowing to store j , by customer k . H_i^k represents the number of households in each MSOA by household type k (OAC) and \bar{G}_i^{kl} represents the average level of grocery expenditure for household type k shopping at retailer type l in MSOA i . This could have been done prior to the model being run so that demand equals the total level of available expenditure in the system. However, calculating the revenue figures after the model has been run accounts for the adjustments in consumer behaviour. For instance, a ‘city living’

consumer is likely to spend less in an Aldi store on average than in a Waitrose store. The demand has not been altered (total number of households remains the same); it is just the variations in consumer/brand spending that is being factored in. In any case, there is no established methodology for estimating small-area market share figures. Retailers often use in-house techniques based on their own consumer data, geodemographics, headline surveys and data sets produced commercially by consultancies such as GMAP Ltd, CACI and Experian (Newing *et al.*, 2013). However, demand estimates are commonly derived using household expenditure figures obtained from survey data, coupled with small-area household counts and geodemographic data. Consequently, the methodology does draw some comparisons with that of Newing *et al.* (2013); however, it is felt that the use of the extensive ROP survey data instead of the smaller Living Costs and Food (LCF) survey will lead to more accurate results (see the discussion on data characteristics in Chapter 4).

Furthermore, so that potential sites identified for expansion are in accordance with the Competition Commission's (CC) regulatory frameworks, each of the recommended sites will adhere to the 'competition test' outlined in the CC (2008) report concerning the planning decisions on so-called larger grocery stores Hughes *et al.* (2009: 581) detail the specific conditions of the report for potential sites, which states that a particular retailer (e.g. Aldi) will fail the test for a particular local area (i.e. within a 10-minute drive around the store) if all three of the following criteria were true:

- “(i) the grocery retailer was not a new entrant in the local area (Aldi can't already be in the area);*
- (ii) the total number of fascias (any brand) in the local area were three or fewer (must be more than three competitors); and*
- (iii) the retailer would have 60% or more of groceries sales area (including the new store) in the local area (Aldi cannot be too dominant)*

8.3 Opportunities for Growth in Saturated Markets: Yorkshire and the Humber

As stated, Yorkshire and the Humber is an area where the discounters already have a strong presence. The former Netto in particular had a long history in the region, having opened its first British store in Leeds in 1990. Since then, all three discounters (Netto, Aldi and Lidl) have invested heavily in the region and the remaining two discounters (Aldi and Lidl) have targeted the area as one of their main locations for future expansion. It is likely that this interest in the area has been triggered by recession, which has caused and accelerated 'switching' behaviour in the region from customers previously shopping at many of the 'big four' retailers (see Chapter 6). As such, Yorkshire and the Humber represents an excellent study region to assess whether spatial analysis can still reveal major opportunities for expansion – especially for an established

retailer in the area such as Aldi, for whom it might be argued there is an increased threat of market saturation (Thompson *et al.*, 2012).

8.3.1 Current Market

So far, many of the sub-national indicators of market share or market performance have been calculated using floorspace or the percentage of households that shop at each retailer. However, it is known that different consumers, depending on their characteristics, record varying levels of grocery expenditure and are likely to shop at different retailers. This ultimately has an effect on the sales generated by the grocery retailers and thus their market share. Consequently, Table 8.1 provides market share figures calculated using a combination of the flows (households) from the defined disaggregated SIM and average expenditure by each OAC supergroup and retailer. This means the results are more representative of the actual market share each grocery retailer is able to obtain. As regional level market share data are not made readily available in the academic literature (with the exception of Thompson *et al.*, 2012 and Newing *et al.*, 2013) and annual reports, the results in Table 8.1 provide a valuable insight into the sub-national performance of the current major grocery retailers in GB. It should be noted that despite being taken over, Netto has been included in the model as the latest 2012 from GMAP Ltd contained a number of Netto stores that were still trading and had yet been converted or sold by Asda. In order to provide an element of validation for the estimations, market share estimates are also provided by GMAP Ltd. These results are calculated through the company's own store forecast models that take advantage of an array of client specific data, market data and industry sources. It is evident that the results produced by the defined model are consistent with those from GMAP Ltd, adding further verification and credibility to the stringent calibration of the SIM in Chapter 7. There are some slight variations between the results, although this is because not all brands are modelled in the GMAP Ltd data, and the results are not available by store format for Tesco and Sainsbury's.

The market share data and additional summary statistics in Table 8.1 illustrate that Morrisons are the market leader (26.32 per cent), followed by Asda (21.62 per cent), Tesco (19.45 per cent) and Sainsbury's (11.69 per cent). These levels of market share are largely determined by the number of stores and subsequent floorspace that each retailer has in the region. However, the fact that Morrisons are able to achieve a greater share than Asda demonstrates why there was a brand factor built into the activeness of each store within the SIM (see Chapter 7). In relation to its national market share in 2011/12 which was around 2.9 per cent (Kantar World Panel, 2012), Aldi is performing well in Yorkshire and the Humber. This is because it has steadily been increasing the number of stores in the region since 2002, which amounted to 35

stores and 305,612 square feet in 2012. Nevertheless, out of the two remaining discounters, Lidl is shown to be the more dominant with a market share of 3.04 per cent and eight more stores.

Table 8.1. Grocery market profile, Yorkshire and the Humber, 2012

Axiom Brand	Stores	Mean Floor space (sq ft)	Total Floor space (sq ft)	SIM Market Share (%)	GMAP Market Share (%)
Aldi	35	8,732	305,612	2.80	2.84
Asda	27	80,863	2,183,295	21.62	22.13
Budgens	2	6,840	13,679	0.12	0.05
Co-op	82	9,881	810,217	6.10	6.54
Farm Foods	24	7,000	168,000	1.23	N/A
Iceland	39	4,918	191,806	1.30	N/A
Lidl	43	9,542	410,293	3.04	2.97
Marks & Spencer	18	10,500	189,000	1.45	N/A
Morrisons	54	31,865	1,720,715	26.32	27.77
Netto	61	6,000	366,000	2.78	N/A
Sainsbury's	34	27,868	947,506	11.60	12.07
Sainsbury's Local/Central	2	5,125	10,250	0.09	N/A
Tesco	49	35,384	1,733,826	18.37	20.71
Tesco Metro/Express	8	11,349	90,789	1.08	N/A
Waitrose	7	24,024	168,168	1.07	1.31
Other	6	17,600	105,600	1.02	3.61
Total	491	19,175	9,414,756	100	100

Source: GMAP Ltd (2012)

In conjunction to the summary statistics in Table 8.1, Figure 8.1 exemplifies low-level (MOSA) market share estimates for Aldi across the entire region. The locations of Aldi stores in 2012 along with the other competitors in the market are also provided for context. As expected, the highest levels of market share are concentrated to the immediate zones around each of the stores, except where there are particularly high levels of competition. The combination of data in Figure 8.1 provides an essential piece of information in the process for finding potential locations, for it is possible to see where Aldi is currently performing well and where there might be room for expansion (low market share or no retail presence). Despite being a region where Aldi has a relatively strong presence (see Chapter 5), the lower levels of market share in certain areas (Craven, Harrogate, Doncaster, Hambleton, Sheffield and the East Riding of Yorkshire) suggest there may be opportunities for new stores. Nevertheless, from Figure 8.1 alone, it is not known whether the population and customer base in these areas would best suit the introduction of a new Aldi store. As such, these issues are addressed in more detail in the following section.

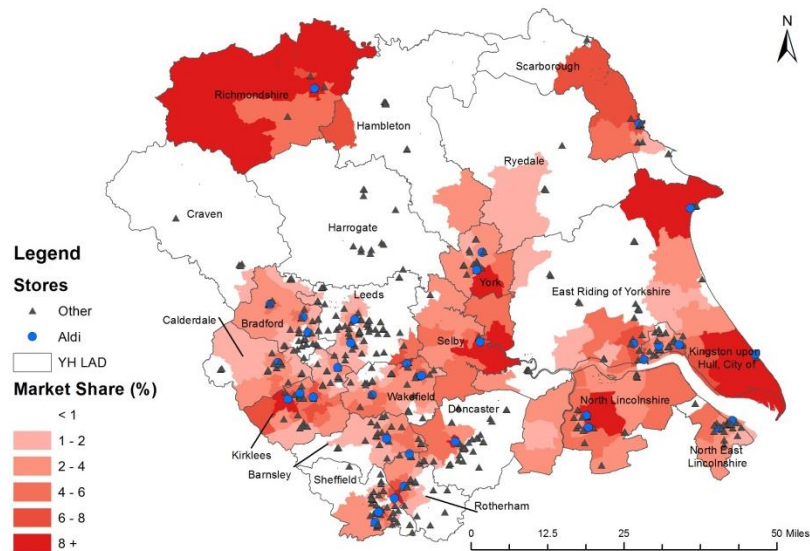


Figure 8.1. Aldi market share by MSOA in Yorkshire and the Humber, 2012

Source: GMAP Ltd (2012)

8.3.2 Site Identification

Next, by using geodemographic analysis, it is possible to begin selecting new Aldi sites within Yorkshire and the Humber. The approach utilised is similar to that employed by Wrigley and Clarke (unpublished), although by using geodemographic area types instead of socioeconomic groups, the research attempts to detect a more nuanced consumer base than the simple Jicnar classification (Thompson *et al.*, 2012). Consistent with the customer profiling in Chapter 6, data from Acxiom’s ROP are combined with the 2001 OAC to profile Aldi’s main customers (Figure 8.2). The data represent the percentage of households in each OAC supergroup that use Aldi for their main weekly grocery shop.

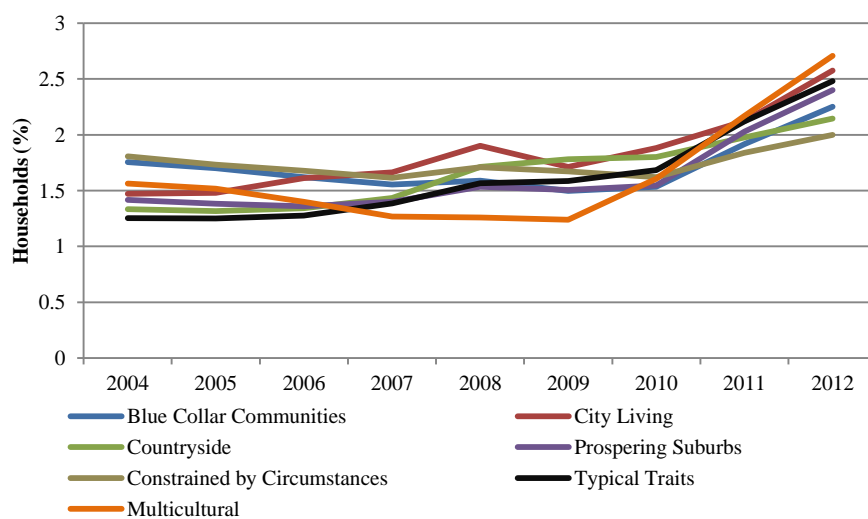


Figure 8.2. Aldi market share by OAC in Yorkshire and the Humber, 2004-2012

Source: Acxiom Ltd (2004-2012); Vickers and Rees (2007)

It is evident from Figure 8.2 that Aldi's customer profile has changed somewhat over the time period, especially since 2007, when the financial crisis reached GB. Between 2004 and 2007, Aldi had a strong following from those consumers termed 'constrained by circumstances' and 'blue collar communities'. However, in 2007/08, the share of these customers was overtaken by other groups, suggesting an increasing differentiation of customers within the discount market. During 2007 and 2009, which represented a particularly turbulent time in the economy, Aldi recorded the increased proportions in the 'countryside', 'city living' and 'typical traits' supergroups. The rise in customers from these more affluent groups is believed to be a result of the increase in cash-rich, time-rich households reverting to shopping at discounters to get better value for money (Thompson *et al.*, 2010; CACI, 2011). Figure 8.2 illustrates that, since 2009/10, Aldi has recorded further growth across all customer types. However, growth in the 'countryside' supergroup has subsided slightly, replaced instead by the continued growth in 'multicultural' households.

In the context of future expansion, it is important that Aldi locates in areas which are well represented by the company's current and future customer base. However, given the documented instability in the market brought about by the recession, it is important that potential stores are bordered by those consumers who will remain dedicated once the market stabilises. Consequently, two types of sites will be recommended for expansion. The first represents a strategy identifying locations consistent with Aldi's conventional customer base of the more deprived consumers ('constrained by circumstances' and 'blue collar communities'), which have historically been the discount retailers core patrons leading up to the recession. Secondly, on account of the increase in the more prosperous customers, the analysis will also examine a potential expansion into 'middle Britain', moving the focus from deep discounting to serving more middle markets (a potential change in the value-platform growth strategies) which Aldi (and Lidl) now seem to be championing (see Chapter 6). Therefore, sites populated by a combination of the 'multicultural', 'city living' and 'typical traits' supergroups are also selected to best serve a new Aldi supermarket.

Figure 8.3(a) illustrates that Aldi's traditional customer base is primarily located in West Yorkshire and South Yorkshire. For instance, the highest concentrations are found to be located south of Leeds, in Bradford, Wakefield, Sheffield and Doncaster. There are also a number of concentrated pockets in Hull and towns along the east coast. As expected, Aldi already has a number of stores in these areas, although there are still a few locations around Doncaster, Rotherham, Leeds and Selby that remain unserved. In comparison, Figure 8.3(b) highlights the difference in the spatial distribution of the newer customer base which has been turning to Aldi across the region. For example, the highest proportions of the 'multicultural', 'city living' and 'typical traits' consumers are located to the west of the region around Bradford (known for its

higher percentage of ethnic minorities) and the centres of the major cities (influence of ‘city living’ supergroup). There are also increased numbers in the more affluent Local Authority Districts (LAD) such as Harrogate and York as well as the north west corner of Leeds.

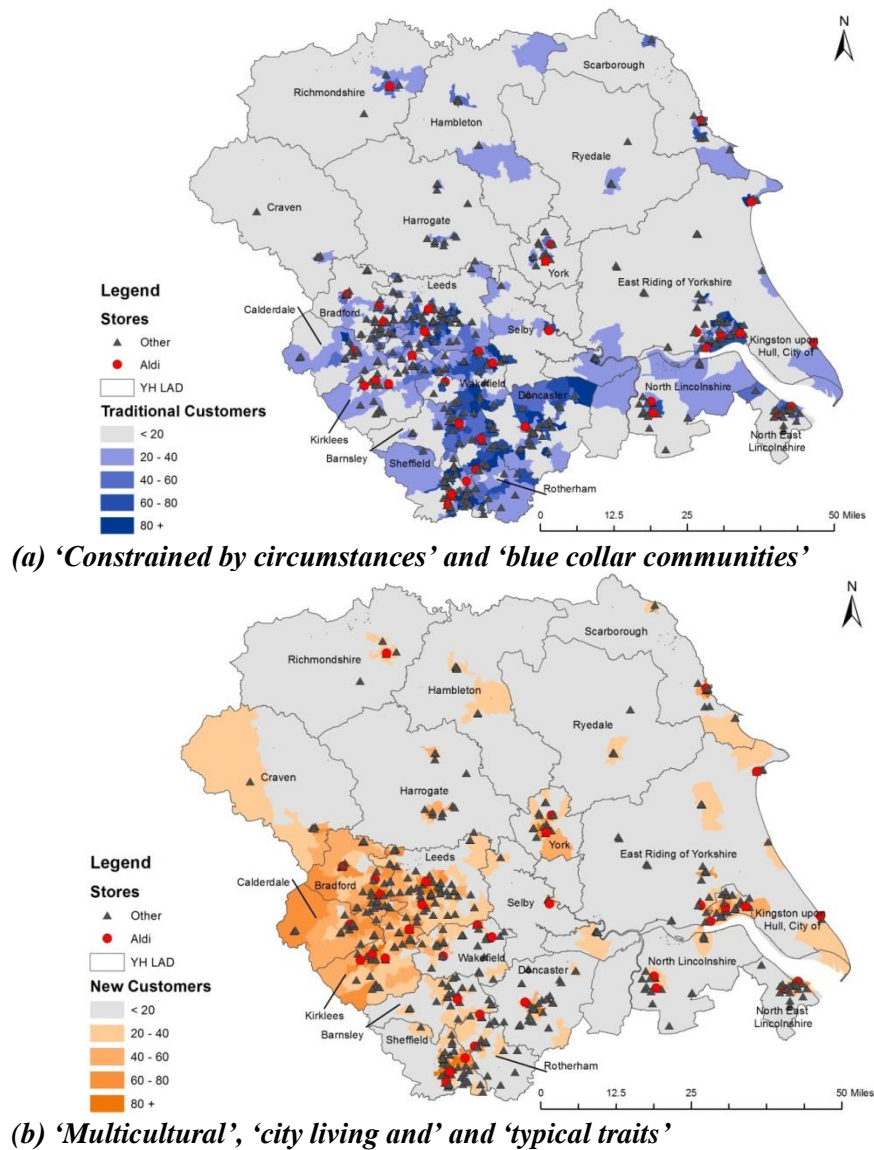


Figure 8.3. Percentage of households in selected OAC supergroups in Yorkshire and the Humber, 2012

Source: Acxiom Ltd (2010 – 2012); Vickers and Rees (2007)

8.3.3 Store Forecast Model: Single Site Assessment

Although the geodemographic analysis is useful for highlighting areas of high potential, grocery retailers need the reassurance of hard revenue forecasts before investing in new sites (Birkin *et al.*, 2010). Therefore, taking the previous discussion and analysis into consideration (Aldi’s corporate objectives, CC planning guidelines, small-area market share estimates, spatial distribution of grocery competition, geodemographics and population density), the following

section details the performance of a collection of sites across Yorkshire and the Humber after the introduction of a new Aldi store. In this instance, two separate location types are examined. The first will be those Aldi has been more accustomed to in the region and represent catchments populated by their original customer base ('constrained by circumstances' and 'blue collar communities'). The second set of locations characterise the growing number of consumers from areas termed 'multicultural', 'city living' and 'typical traits'. It is believed this new customer base is likely to stay for the long-term and thus must be taken into consideration if Aldi is to continue to expand in what could be a saturated market for the discount grocer. In both instances, so to ensure each of the prospective locations contains the necessary levels of demand, certain thresholds have been applied to the data from Figure 8.3. More specifically, the areas recommended for investment all have an above average population density (see Chapter 4) greater than the average for the region and the percentage of households from Aldi's main customer groups (two location types treated separately) sum to a minimum of 75 per cent.

It should be noted that over 50 locations were identified based on the customer profiling and population density thresholds; however, due to the restrictions of the thesis size, it would not be possible to run through every scenario. Consequently, eight locations were selected from the prospective MSOAs based on the combination of the available data (demand, competition and proximity to an existing Aldi store). These sites are illustrated in Table 8.2 and are categorised by different location strategies (traditional customers and new customers). The first four locations are associated with the more deprived areas of Yorkshire and the Humber in inner city areas of Leeds, Doncaster, Sheffield and Barnsley. In contrast, the remaining four scenarios in Harrogate, Doncaster, Leeds and Kirklees represent the types of areas Aldi should be targeting if its success continues outside of its historical customer base. It should be highlighted that scenario 5 will involve forecasting the performance of a relocated Aldi store from MSOA E02001554 to E02001557 in Doncaster. Bennison *et al.* (1995) state that in site location strategy, the focus on the new, individual site has, arguably, deflected attention from more complex pattern of locational decision making that is required by retailers. This could not be more relevant in the current financial climate where, for many retailers, the question may not just be where to open, but where to relocate, extend or even close.

On selecting each of the locations in Table 8.2, the new Aldi stores were run through the disaggregated SIM as a single site assessment (in isolation of the other scenarios). It is important to point out that whilst the selected zones represent the desired level of potential (based on their characteristics), in reality the proposed sites may not be suitable. No research has been undertaken on the suitability of local transport networks or the cost and availability of land within the MSOAs. The purpose of the scenario is to simply assess the performance of an Aldi store, should one be built in any of the selected MSOAs. On account of the average Aldi

store size within the region, the new stores were assigned a size of 9,000 square feet. It is likely that many of the locations could sustain a bigger or smaller store, however Aldi have tended to favour stores of this size across the region.

Table 8.2. Potential locations for new Aldi stores in Yorkshire and the Humber, 2012

ID	Scenario	Customer Type	MSOA	LAD	Ward	Customers Proportion	Households	Population Density Index
1	Open	Traditional	E02002379	Leeds	Seacroft	0.94	2044	1.64
2	Open	Traditional	E02001573	Doncaster	Coinsbrough	0.85	3126	1.21
3	Open	Traditional	E02001655	Sheffield	Handsworth	0.81	3419	1.71
4	Open	Traditional	E02001515	Barnsley	Athersley	0.94	3918	1.34
5	Open	New	E02005775	Harrogate	High Harrogate	0.90	4497	2.10
6	Relocation	New	E02001554 to E02001557	Doncaster	Townfield	0.93	3965	1.04
7	Open	New	E02002366	Leeds	Roundhay	0.77	2844	1.23
8	Open	New	E02002293	Kirklees	Thornhill	0.94	2624	1.08

After running each scenario through the SIM, Table 8.3 illustrates the model results, detailing the overall performance of each store and how it would rank against existing Aldi stores in the network. The figures suggest that Aldi is right to target the region as many of the stores would perform well in comparison to existing stores. For instance, when ranking the sales per square foot figures against the other 35 stores, all but one of the scenarios would come within the top 20. Moreover, the relocated store in Doncaster (scenario 5) moves from previously being ranked as the 27th to the 12th best performing. In terms of the performance of each store, the worst performing store is scenario 1, located in Seacroft. Recognised as one of the more deprived areas of Leeds, Seacroft has traditionally been avoided by many grocery retailers which has led to the area being described as a ‘food desert’ (Whelan *et al.*, 2002). However, based on the results from Table 8.3, this is not surprising as the model results are less than favourable. Nevertheless, the remaining sites in the traditional locations (scenario 2, 3 and 4) are predicted to perform well, with scenario 2 ranking as the second best and scenario 3 as the third best out all Aldi stores. However, due to the high levels of sales generated by these two stores, each are associated with the highest levels of cannibalisation. Although, as cannibalised sales account for less than 3 per cent of the new stores weekly sales, this should not be a concern. In contrast, whilst the last four scenarios also generate positive results, it might have been expected that these location would outperform the more traditional sites – given that the $W_j^{a^{kl}}$ parameters in Chapter 7 make an Aldi store more attractive to ‘city living’, ‘multicultural’ and ‘typical traits’ households. However, whilst they do in fact perform well in relation to existing stores, Table 8.5 would imply these stores would not outperform scenarios 2, 3 and 4. This could be due to a number of reasons. First of all, the competition is likely to be higher in areas with a high

proportion of ‘city living’ and ‘multicultural’ households as these areas tend to be located closer to the city centre. Furthermore, with many parts of Yorkshire and Humber being very rural and dominated by an overwhelmingly white population (see Chapter 4), multicultural consumers are likely to be in the minority (in terms of actual counts).

Table 8.7. Aldi performance after scenarios in Yorkshire and the Humber, 2012

ID	Size (Sq ft)	Performance (Sales /sq ft)	Performance Rank (/35)	Households per week	Average Weekly Sales (£)	Cannibalisation weekly spend (£)	Aldi Market Share (%)
1	9,000	10.86	26	1,757	97,697	-562	2.87 (2.79)
2	9,000	17.72	2	2,831	159,444	-2,527	2.91 (2.79)
3	9,000	15.54	6	2,526	139,823	-3,268	2.89 (2.79)
4	9,000	16.15	3	2,565	145,349	-3,294	2.88 (2.79)
5	9,000	12.55	15	1,976	112,959	-47	2.87 (2.79)
6	9,000	13.12 (from 10.02)	12 (from 27)	2,075	117,941 (from 109,880)	1,77	2.87 (2.79)
7	9,000	11.65	18	1,902	104,859	-1,084	2.88 (2.79)
8	9,000	12.86	10	2,075	115,755	-2,637	2.87 (2.79)

Due to the disaggregated nature of the SIM, it is also possible to investigate the level of customer penetration by OAC supergroups in each scenario (Figure 8.4). In terms of those stores located in the traditional customer locations (scenarios 1-4), the presence of those households from areas termed ‘constrained by circumstances’ and ‘blue collar communities’ are clearly visible. Scenarios 2 and 3 are heavily dominated by the ‘blue collar communities’ supergroups, whilst scenarios 1 and 4 clearly provide an option for the more deprived ‘constrained by circumstances’ consumer. In comparison, the scenarios which targeted the growing number of consumers from the ‘multicultural’, ‘city living’ and ‘typical traits’ supergroups are also evident in Figure 8.4(b). Scenario 5 for example, located in the affluent town of Harrogate is predicted to attract an increasing number of households from areas defined as ‘prospering suburbs’, ‘city living’, ‘countryside’ and ‘typical traits’ (middle Britain). The fact there are locations whereby Aldi can still target traditional consumers demonstrates the discount retailer are well placed should the new customer base decline once the economy recovers (although this is not expected). Moreover, if Aldi is to target the influx of new customers that are trading down and move away from its traditional value platform, the evidence would also imply this customer base is available. This will be reassuring for the discount grocer, as continuing with locating in its traditional sites will eventually incur a substantial level of cannibalisation.

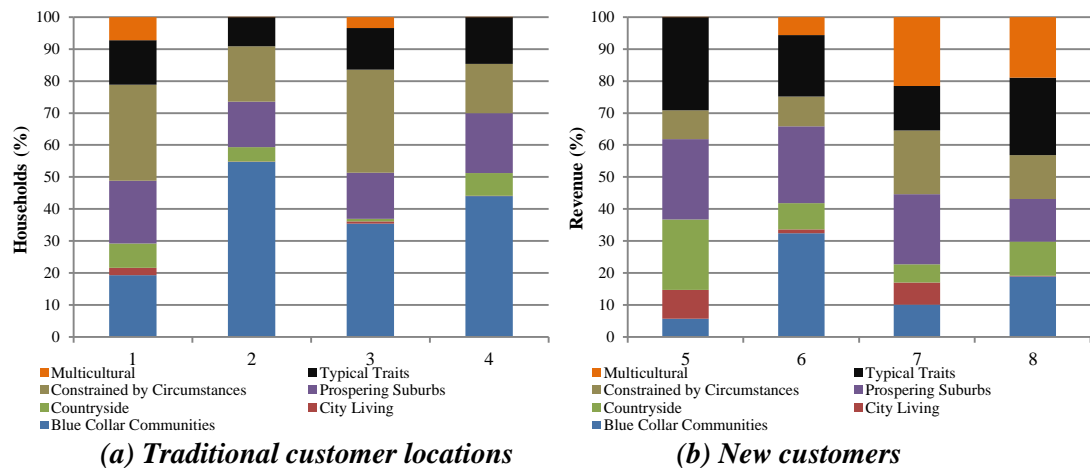


Figure 8.4. Customer profiles of scenario stores, Yorkshire and the Humber

Source: Vickers and Rees (2007)

An important part of any site location strategy is also the impact a given scenario will have on competing brands in the market. Therefore, Table 8.4 illustrates the number of households that will leave other brands with the introduction of a new Aldi store in Yorkshire and the Humber (red high and blue low). On account of the balancing factor discussed in Chapter 7, the raw numbers all total up to 0 (increase in Aldi customers + decrease in other brands). In terms of the different types of locations, scenarios 2, 3 and 4 have the greatest impact on other brands, generating Aldi over 2,000 new customers a week. In general, those brands expected to lose the most customers are estimated to be Asda, Morrisons, Tesco and Sainsbury. This will be a concern for the ‘big four’ as the latest figures suggest they continue to be squeezed out the market by the discount retailers (Neville, 2013). However, when calculated as a proportion of the households that shop at these retailers (before scenario) the overall impacts are far less distinct. As expected, the relocation of an existing store in scenario 6 has the smallest effect, however what is interesting is the positive influence on a nearby Morrison store. Comparing the two types of locations, Table 8.4 demonstrates an increased impact on high-end retailers such as Waitrose and Sainsbury’s in scenarios 5 and 8 respectively, whilst the traditional locations on the whole effect Budgens, the former Netto, Iceland and Asda the most.

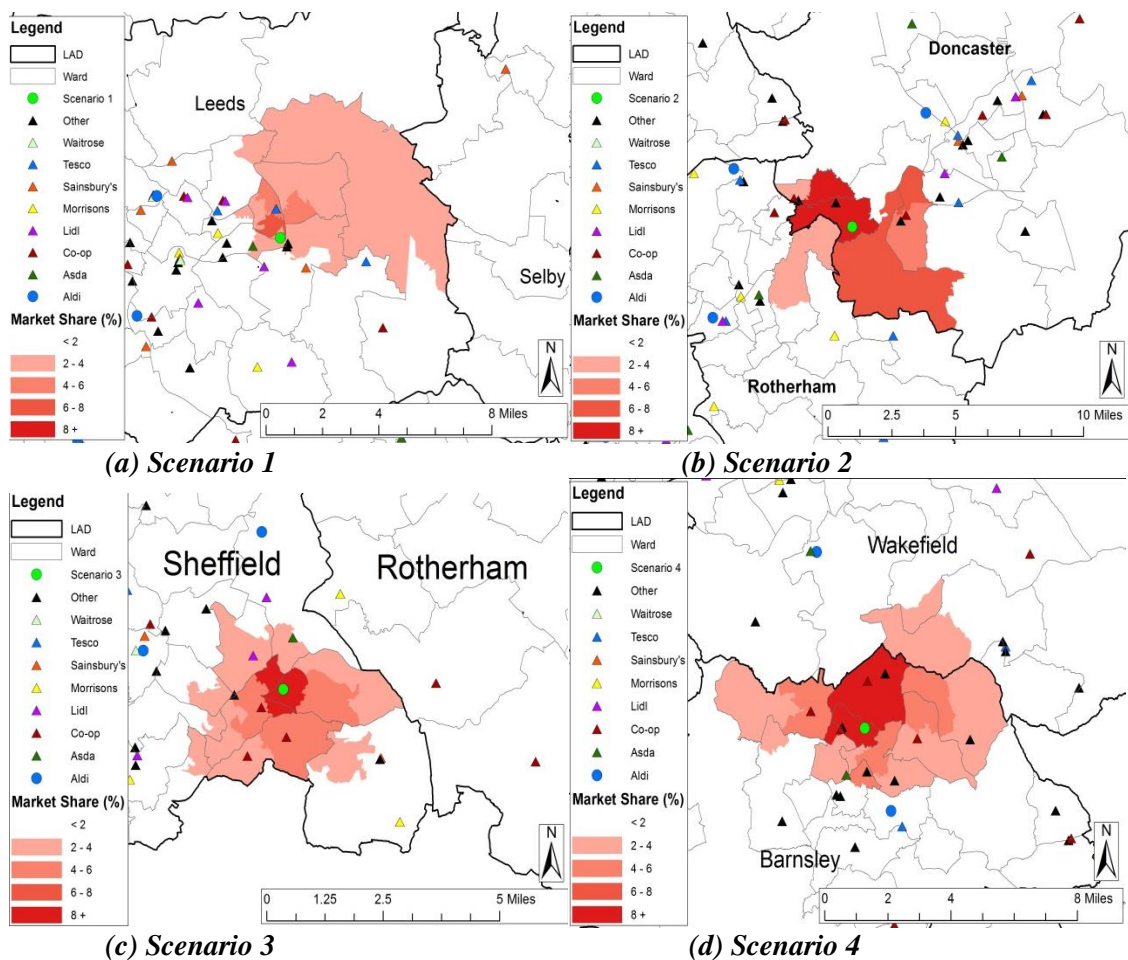
Finally, Figure 8.5 displays low level market shares for the different scenarios and plots the surrounding competing stores. The results demonstrate how localised store catchments are not uniform, as they are determined by a combination of demand and supply in the immediate area. The maps have also been cut off to a radius of about ten miles, so as to determine the localised effect of each scenario. First of all, it can be confirmed that each location passes the CC (2008: cited in Hughes *et al.*, 2009) ‘competition test’. In each instance, the new Aldi store has less than 60 per cent of the groceries sales area (including the new store) and the total fascias are greater than three. It is recognised in Figure 8.5 that there are instances where an Aldi store will

not be a new entrant to the local area (scenario), but in all cases they pass the other two ‘tests’ so this would not be an issue.

Table 8.4. Brand impacts for individual scenarios, Yorkshire and the Humber

Scenario ID	1	2	3	4	5	6	7	8
Increase in Households								
Aldi	1,747	2,786	2,466	2,508	1,975	150	1,882	2,028
Asda	-326	-375	-1016	-1086	-973	-137	-287	-765
Budgens	0	0	0	-29	0	0	0	-1
Co-op	-51	-249	-146	-272	-130	-13	-84	-63
Farm Foods	-17	-13	-17	-14	0	-8	-38	-53
Iceland	-27	-7	-53	-57	0	-16	-25	-18
Lidl	-74	-35	-106	-9	-20	-24	-107	-140
Marks & Spencer	-42	0	-36	-20	-10	0	-36	-29
Morrisons	-332	-756	-515	-273	-384	251	-441	-416
Netto	-49	-319	-76	-232	-3	-17	-67	-81
Sainsbury's	-200	-32	-271	-14	-281	-70	-258	-294
Sainsbury's Local/Central	0	0	0	0	0	0	0	0
Spar	0	0	0	0	0	0	0	0
Tesco	-573	-759	-151	-500	-17	-125	-463	-168
Tesco Metro/Express	-43	-241	-46	-1	0	10	-42	-1
Waitrose	-13	0	-32	0	-144	0	-34	0
Other	0	0	0	0	-13	0	0	0
Total	0	0	0	0	0	0	0	0
Percentage Increase on Current Revenue								
Aldi	2.57	4.10	3.63	3.69	2.91	0.22	2.77	2.99
Asda	-0.07	-0.08	-0.21	-0.23	-0.20	-0.03	-0.06	-0.16
Budgens	0.00	0.00	0.00	-1.02	0.00	0.00	0.00	-0.04
Co-op	-0.03	-0.16	-0.10	-0.18	-0.09	-0.01	-0.06	-0.04
Farm Foods	-0.05	-0.04	-0.05	-0.04	0.00	-0.03	-0.12	-0.17
Iceland	-0.08	-0.02	-0.16	-0.17	0.00	-0.05	-0.07	-0.05
Lidl	-0.10	-0.04	-0.14	-0.01	-0.03	-0.03	-0.14	-0.18
Marks & Spencer	-0.13	0.00	-0.11	-0.06	-0.03	0.00	-0.11	-0.09
Morrisons	-0.05	-0.12	-0.08	-0.04	-0.06	0.04	-0.07	-0.07
Netto	-0.07	-0.45	-0.11	-0.33	0.00	-0.02	-0.09	-0.11
Sainsbury's	-0.08	-0.01	-0.11	-0.01	-0.11	-0.03	-0.10	-0.12
Sainsbury's Local/Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tesco	-0.14	-0.18	-0.04	-0.12	0.00	-0.03	-0.11	-0.04
Tesco Metro/Express	-0.16	-0.89	-0.17	0.00	0.00	0.04	-0.16	0.00
Waitrose	-0.06	0.00	-0.15	0.00	-0.67	0.00	-0.16	0.00
Other	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	0.00

The immediate competition surrounding each of the new stores in Figure 8.5 also provides additional context and explanation to the brand level effects in Table 8.4. The increased number of customers found to be moving from Asda and Morrisons in the traditional customer locations (scenarios 1 to 4) is down to the presence of a store in the local area. This puts Aldi in direct comparison with the two prominent retailers whose primary customer base involves also those termed ‘blue collar communities’ and ‘constrained by circumstances’. However, given the customer to brand interactions in the $W_j^{a^{kl}}$ parameters in Chapter 7, the effect is not quite as pronounced as locating in areas with a high proportion of ‘city living’ households and a nearby Sainsbury’s or Waitrose (scenario 5), and increased levels of ‘multicultural’ customers with a Budgens, Lidl or Farm Foods store (scenarios 7 and 8).



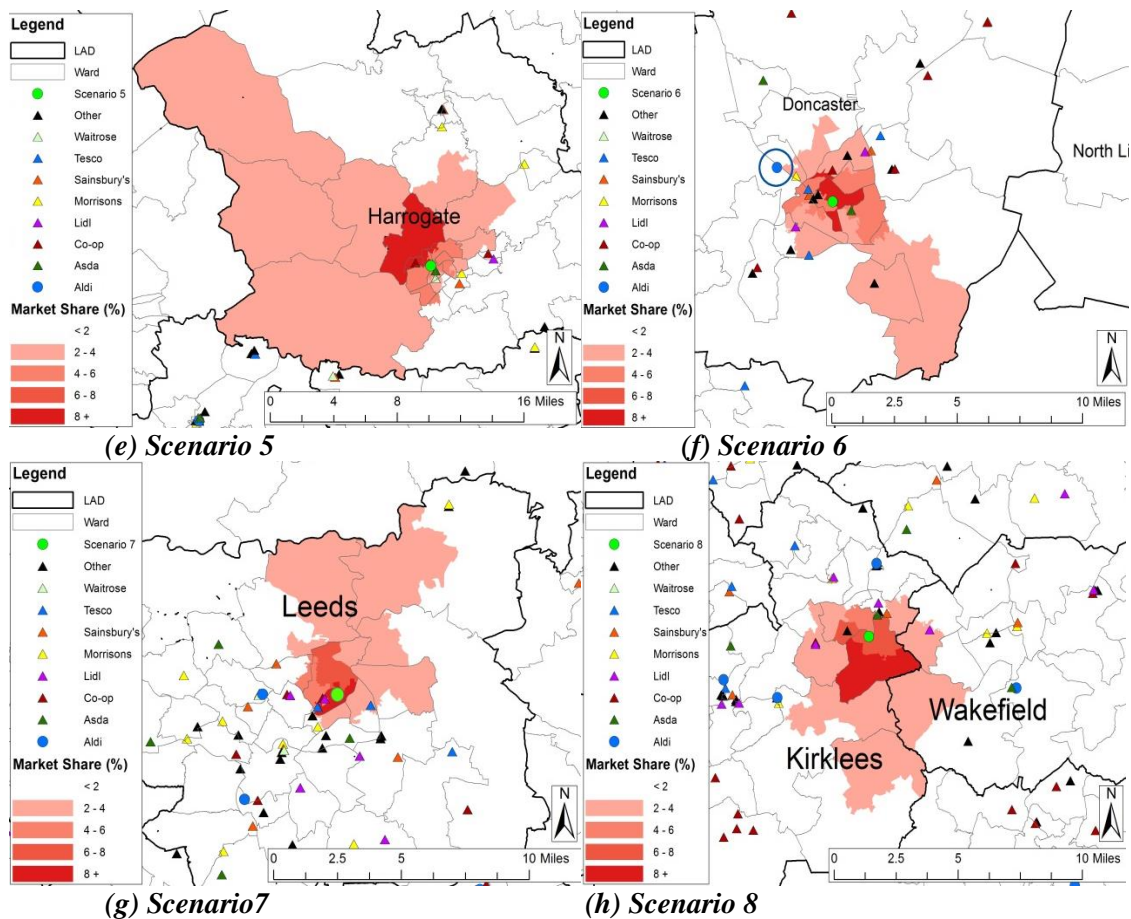


Figure 8.5. Individual scenario low-level market shares, Yorkshire and the Humber

Source: GMAP Ltd (2012)

8.3.4 Store Forecast Model: Multiple Site Assessment

So far, each scenario has been examined separately so that the individual sites could be compared. However, in addition to the short-term goals of building individual stores, it is known that Aldi has ambitious long-term plans to increase its market share above 10 per cent by 2020 (Daily Mail, 2008). It is impossible to know how the market will develop over the rest of the decade as many of the grocery retailers will also continue to expand. If trends from the previous ten years are anything to go by, there are likely to be additional mergers and acquisitions (e.g. Asda and Netto), new market entrants (Haldanes) and further closures. Nevertheless, so to try and understand how likely it will be for the Aldi to reach its target of 10 per cent, Table 8.5 provides the results from running all eight scenarios through the SIM together. On observing the model outputs, it is predicted that the seven new stores and the relocated store will increase Aldi's revenue by nearly 23 per cent and its market share from 2.80 to 3.43 per cent. Whilst this is not a substantial increase, it would mean (everything else remaining constant) that Aldi would overtake its main rival, Lidl, in the discount market. In terms of Aldi's current rate of expansion in the region, it is expected that this would take two to three years to achieve.

So to provide a geographic insight, the low-level market share estimates from the multiple assessments are mapped out in Figure 8.6 to highlight which parts of the region Aldi is predicted to be most successful. The impact of the store in Harrogate is perhaps most noticeable, as this is an area where Aldi previously had no presence at all. The impacts of the other scenarios are less visible, on account of the increased number of existing Aldi outlets. However, it is evident that MSOAs with previously low market shares will record a market share of over 6 per cent. In addition to growth, the map also illustrates the opportunities that remain in the more rural parts of the region (Craven, Doncaster, Hambleton and Calderdale) which might benefit from a new, larger store format.

Table 8.5. Impact of multiple scenarios in Yorkshire and the Humber

	Growth in Revenue (%)	Final Market Share (%)
Aldi	22.69	3.43
Asda	-1.04	21.40
Budgens	-1.07	0.12
Co-op	-0.65	6.06
Farm Foods	-0.49	1.22
Iceland	-0.61	1.29
Lidl	-0.65	3.03
Marks & Spencer	-0.52	1.44
Morrisons	-0.47	26.21
Netto	-1.19	2.74
Sainsbury's	-0.56	11.54
Sainsbury's Local/Central	0.00	0.09
Spar	0.00	0.00
Tesco	-0.66	18.26
Tesco Metro/Express	-1.35	1.07
Waitrose	-1.04	1.06
Other	-0.05	1.02
Total		100

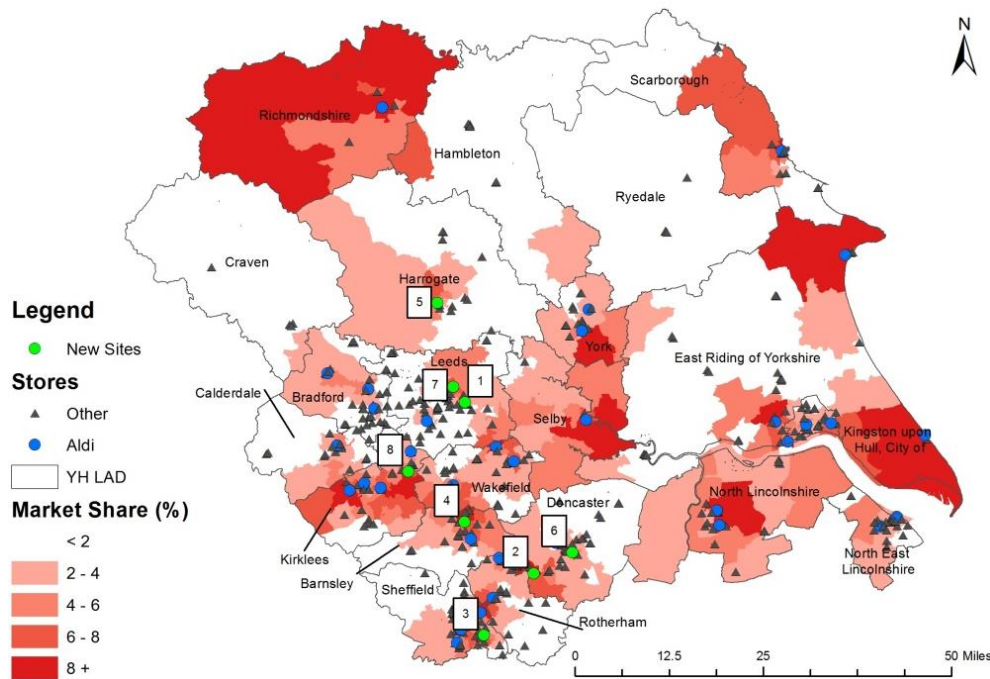


Figure 8.6. Multiple scenario low-level market shares, Yorkshire and the Humber
Source: GMAP Ltd (2012)

8.4 Opportunities for Growth in Untapped Markets: London

In comparison to Yorkshire and the Humber, London is an area which is not as well served by the discount retailers (Aldi and Lidl). One may argue that this partly reflects the high rental costs for retail space across the city and the difficulty of finding good sites. The standard model for a discount store is one with low operational costs built on relatively cheap land (Colla, 2003). Therefore, it is feasible that high rent prices could be eating into the discounter’s profits, whilst the bigger companies such as Tesco and Sainsbury’s can afford to take on these additional costs. Nevertheless, London is possibly the primary target for Aldi – identified as a key part of its store expansion programme (Lawson, 2012). It was even described as a ‘gold mine’ in 2008 by Graham Hetherington, the company’s director for London and the South East (Mail Online, 2008). This is arguably because coupled with the increased cost of land is the potentially high level of revenue available for retailers, driven by increased population density and above average household income. Moreover, in contrast to many of the other regions in GB, since the recession, London continues to prosper economically and is thus an obvious region for Aldi to target (Storper and Scott, 2009; Lee, 2012).

8.4.1 Current Market

In Chapters 5 and 6, London was identified as a region where the limited line discounters have historically had a low presence (in terms of its store network and subsequent demand). This is reinforced by Table 8.6 which provides market share estimates for the region calculated from

the disaggregated SIM. Aldi achieves a low market share of 1.18 per cent and is once more being outperformed by its main rival, Lidl (1.61 per cent). Sainsbury's (30.02 per cent) and Tesco (25.74 per cent) are the dominant forces in the market whilst Asda (12.21 per cent) and Morrisons (8.18 per cent) have a considerably smaller market share, partly a result of the origins of the former companies in the South East (Birkin *et al.*, 2002). Similarly to Section 8.3, various summary statistics are provided in Table 8.6 on the London grocery sector. It is evident that the average store sizes are much smaller than in Yorkshire and the Humber, arguably a reflection of the cost of land and the fact there is a greater emphasis on convenience shopping in London. In terms of Aldi's store network, it has been steadily increasing the number of stores in the region since 2002; however, there were still only 14 stores listed in the 2012 GMAP data. In addition, when compared to the fact Lidl is now reaching nearly 60 stores in the region, it is clear Aldi is well placed to continue to increase the number of stores in London over the coming years.

Table 8.6. Grocery market profile, London, 2012

Axiom Brand	Stores	Mean Floor Space (sq ft)	Total Floor Space (sq ft)	SIM Market Share (%)	GMAP Market Share (%)
Aldi	14	8,653	121,140	1.18	0.99
Asda	24	74,369	1,784,857	12.21	10.92
Budgens	20	5,760	115,198	1.07	0.86
Co-op	62	6,412	397,567	2.52	3.07
Farm Foods	6	7,000	42,000	0.27	N/A
Iceland	112	5,081	569,125	1.60	N/A
Lidl	59	9,834	580,228	1.61	2.75
Marks & Spencer	47	10,500	493,500	3.87	N/A
Morrisons	28	28,063	785,776	8.18	7.76
Netto	7	6,000	42,000	0.27	N/A
Sainsbury's	95	28,387	2,696,777	29.86	32.06
Sainsbury's Local/Central	4	3,134	12,535	0.16	N/A
Tesco	48	43,844	2,104,510	23.99	25.70
Tesco Metro/Express	39	12,042	469,650	1.75	N/A
Waitrose	57	16,585	945,363	9.74	10.26
Other	8	24,625	197,000	1.72	5.63
Total	630	18,027	11,357,225	100	100

Source: GMAP (2012)

So to provide a more detailed view of Aldi's performance in the region, Figure 8.7 presents the spatial distribution of the discount grocer's market share at MSOA level. Given the limited range of stores across London, the spatial patterns are much more defined than that in Yorkshire and the Humber. Aldi has evidently opted for a strategy that has restricted investment for stores in the outer parts of the region. In terms of the opportunities for growth, this provides Aldi with

a number of options for future locations as there are large parts of London where Aldi has very little or even no market share – especially around the city centre (inner London), the south west (Sutton, Kingston Upon Thames) and the south east (Bromley and parts of Greenwich).

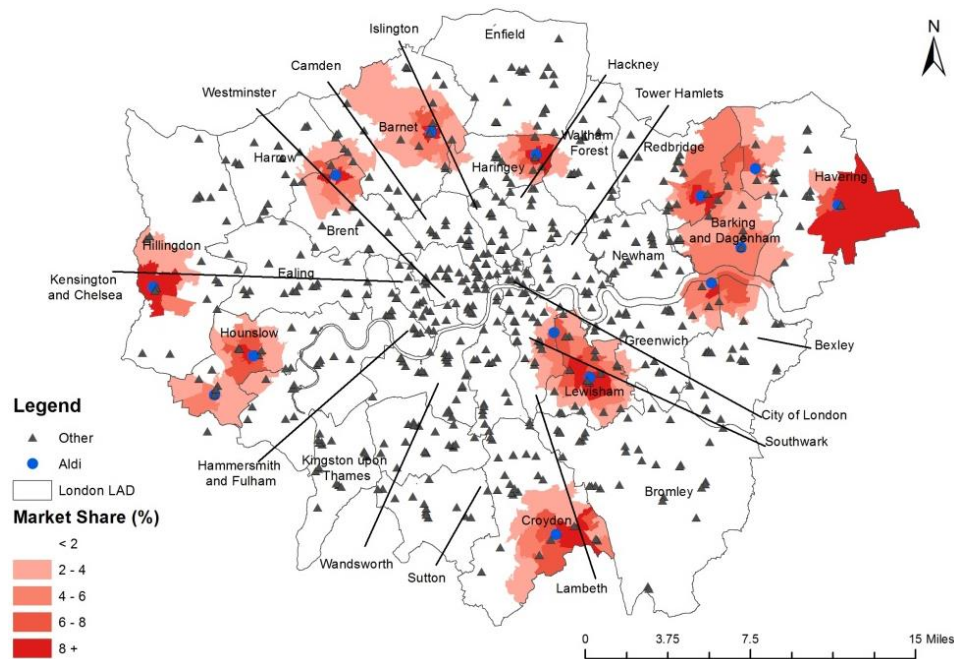


Figure 8.7 Aldi market share by MSA in London, 2012

Source: GMAP (2012)

8.4.2 Site Identification

The aggregate statistics and low-level market share estimations will now be supplemented by more detailed geodemographic analysis. As demonstrated in Section 8.3.2, the geodemographic research represents a useful method for identifying sites that are most likely to be surrounded by Aldi’s primary customer base. Selecting potential sites in this way draws comparisons with the analogue method, which involves making forecasting sales for new sites by making comparisons (or analogies) with other stores in the corporate chain that are alike in location and trade area conditions (Clarke, 1998). This is a trusted methodology in the retail industry and is still a common procedure for site location in the UK (Reynolds and Wood, 2010). However, on account of the more sophisticated techniques now available, analogue methods should only be used to detect potential locations and not be relied on to calculate accurate revenue forecasts. As stated in the previous chapter, a wide variation in store performance can frequently be found between outlets in a retail chain across similar geographical markets (Reynolds and Wood, 2010) – an issue that SIMs are able to handle.

It was established in Chapter 6 that the discount retailers have a different customer base in London to their counterpart stores in Yorkshire and the Humber. This is evidenced in Figure 8.8

which exemplifies the percentage of households by OAC supergroup that shop at Aldi from the ROP. Figure 8.8 illustrates that there has been far less volatility with regard to the customer profile of Aldi since the economic downturn that started in 2007. The analysis in Section 8.3.2 demonstrated a substantial level of ‘switching’ behaviour as many consumer groups (often more wealthy) began to trade down to Aldi. In London, this does not have appeared to be the case, arguably because the retailer does not have the required presence in the region (too few stores). Whilst there was an increase in the ‘constrained by circumstances’ group, this group fell back to its pre-recession position after 2010.

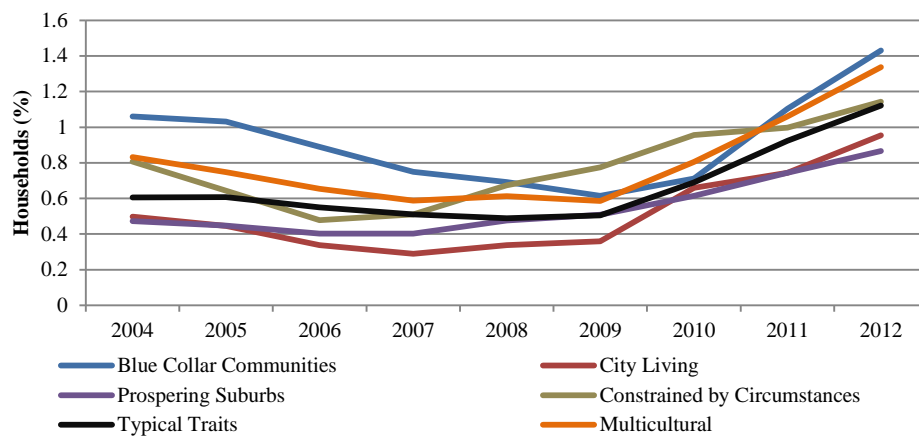


Figure 8.8. Aldi market share by OAC supergroup in London, 2004-2012

Sources: Acxiom Ltd (2004-2012); Vickers and Rees (2007)

Based on the proportions in Figure 8.8, it can be argued that households living in areas termed ‘blue collar communities’, ‘multicultural’ and ‘constrained by circumstances’ are most likely to shop at an Aldi store in London. This is consistent with the values produced in the $W_j^{a^{kl}}$ matrix (based on 2011 and 2012 data) in Chapter 7, as all three groups are designed to be more attracted to an Aldi store. Figure 8.9 represents the total proportion of these households in each MSOA across the region. The spatial pattern of these customers is far less defined than the two maps produced for Yorkshire and the Humber. This is because many OAs in London are classified as ‘multicultural’, on account of the highly diverse ethnic composition of the population (Stillwell, 2010). This is a positive for future expansion and makes locating potential sites slightly easier. As a result, what will be likely be more important is the level of competition from other stores in the catchment area around a new site. It can be seen from the distribution of Aldi stores and the other competitors in Figure 8.9 that London has a far more competitive market (greater density of stores) than Yorkshire and the Humber which will make finding potential locations more challenging.

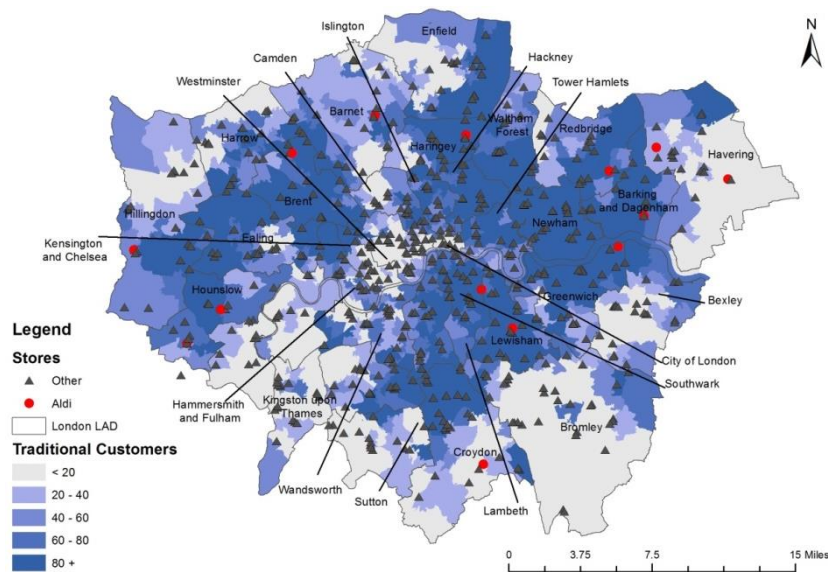


Figure 8.9. Percentage of households in ‘multicultural’, ‘blue collar communities’, and ‘constrained by circumstances’ OAC supergroups in Yorkshire and the Humber, 2011
Sources: Acxiom Ltd (2010 - 2012); Vickers and Rees (2007)

8.4.3 Store Forecast Model: Single Site Assessment

In order to identify potential sites, the same methodology was applied for the London data as in Yorkshire and Humber. All MSOAs were queried to identify those with a minimum of 75 per cent potential customers (‘multicultural’ plus ‘blue collar communities’ plus ‘constrained by circumstances’) and an above average population density. The population density threshold was arguably more important in Yorkshire and the Humber because a number of the more rural MSOA zones contain very small population counts. However, in densely populated areas such as London, people are less likely to travel as far for grocery shopping, which means the local population in a store’s catchment still needs to be of a reasonable quantity (Birkin *et al.*, 2002). The query returned over 2,000 potential MSOAs, highlighting the potential (not taking into account competition) for Aldi in the region. Nevertheless, for the purpose of this thesis, only eight sites were selected to run potential scenarios for. The scenario locations are displayed in Table 8.7 and were selected based on those areas that demonstrated the highest levels of potential but also the least amount of competition. On account of the limited number of stores in the region in 2012, it was far easier to locate locations in London than it was in Yorkshire and the Humber.

Table 8.7. Potential location for new Aldi stores in London

ID	Scenario	MSOA	LAD	Ward	Customer Proportion	Households	Population Density Index
1	Standard	E02000131	Bromley	Crystal Palace	0.78	4,589	1.03
2	Larger format	E02000460	Harrow	Roxbourne	1.00	2,189	1.01
3	Convenience	E02000125	Brent	Queens Park	1.00	4,329	1.70
4	Convenience	E02000265	Ealing	Walpole	0.88	4,747	1.41
5	Standard	E02000528	Hounslow	Brentford	0.78	4,770	1.09
6	Standard	E02000358	Hackney	Stoke Newington Central	0.96	4,775	2.33
7	Standard	E02000199	Croydon	Thorton Heath	0.96	3,172	1.10
8	Convenience	E02000321	Greenwhich	Glydon	1.00	2,877	1.39

Similarly to Section 8.3.3, the disaggregated SIM was utilised to estimate the flow of households from each MSOA to a given grocery store above 3,000 square feet. However, in contrast to Yorkshire and the Humber, London is a complicated market and represents a challenge for any retailer. Aldi understands this, as it has created a new store format of around 4,500 square feet for 'prominent' London locations – as the battle for convenience in the capital intensifies (Lawson, 2012). This is in line with some of the major retailers such as Tesco, Sainsbury's and Waitrose which have all stated their ambitions to expand their convenience formats in London. Historically, Aldi has been inflexible about its stores, preferring instead to stick to a fixed template (as seen in Yorkshire and the Humber). However, it is believed that the new format will complement Aldi's traditional nationwide roll-out programme and will appeal more to consumers in the capital – bolstering the performance of the grocery discounter even further (Kantar Worldpanel, 2012). Therefore, in addition to the standard stores sizes in the region (8,500 square feet), three stores (scenario 3, 4 and 8) of 5,000 square feet in size will be modelled in more central locations of the city. Additionally, to investigate the success of an opposing scenario, a larger store of 15,000 square feet will also be examined on the outskirts of London in Harrow (scenario 2).

The modelled results for each scenario are displayed in Table 8.8. On observing the data, it is clear that the performance figures are very favourable. The sales per square foot data are far higher than those in Yorkshire and Humber, likely to be a result of the increased levels of population density. Additionally, when ranked against the 14 existing stores, all but two of the smaller convenience formats would rank as the top performing store in the region. This is arguably a reflection of the increased levels of competition (low resident population and high density of competitors) faced by stores in central locations. Moreover, it could be that the model is underestimating the flows to these areas as they would undoubtedly have high journey to work populations that would increase sales. Whilst this has been taken into account in the overall score of the outlet (see Chapter 7), it might be more accurate to produce an additional

demand layer for those consumers traveling to work. Newing *et al.* (2013) have experimented with a similar methodology but for tourist demand.

With regard to the individual scenarios, the best performing store is estimated to be the larger outlet in Harrow (scenario 2). It is expected that this would generate the most sales and produce the greatest sales per square foot. This raises an interesting point for the discount grocer, for it appears that Aldi would be well placed in constructing larger stores in addition to the smaller convenience stores it is now trialling in London. As there is already a 12,000 square foot store in London with a sale per square foot estimation of 34.32, it is expected there would be no major issue implementing a slightly larger store. The next best performing scenario is the smaller 5,000 square foot store in Brent. On examining Table 8.8, it is likely these stores are performing so well due to the proportion of Aldi’s customers in the region. In both MSOAs the percentage of households termed (‘multicultural’ + ‘blue collar communities’ + ‘constrained by circumstances’) equals 1. The scenario run for a store in Bromley also produces favourable results; however this scenario is associated with the greatest levels of cannibalisation, more so than the larger store that will pull consumers from a greater distance. On the subject of cannibalisation, scenarios 5 and 8 have the smallest impact on the existing network, due to their proximity to the nearest store and size.

Table 8.8. Aldi performance after scenarios in London

ID	Size (sq ft)	Performance (Sales/sq ft)	Performance (Rank / 14)	Households	Average Weekly Sales (£)	Cannibalisation (£)	Aldi Market Share (%)
1	8,500	38.0	1	5,823	330,986	-4,437	1.34 (1.18)
2	15,000	47.5	1	12,377	714,102	1,362	1.53 (1.18)
3	5,000	38.7	1	3,438	194,566	2,748	1.28 (1.18)
4	5,000	25.6	4	2,338	132,769	-570	1.25 (1.18)
5	8,500	35.5	1	5,420	306,394	-63	1.33 (1.18)
6	8,500	71.7	1	10,746	609,451	-2,286	1.48 (1.18)
7	8,500	34.8	1	5,338	303,659	1,248	1.33 (1.18)
8	5,000	20.2	8	1,767	101,290	199	1.23 (1.18)

Next, the customer profiles of each store are considered in Figure 8.10 Those located to the south of the river in Bromley (scenario 1) and Croydon (scenario 7) are estimated to attract a large percentage of ‘multicultural’ households, supported by a 15 per cent intake of ‘city living’ consumers. Despite the general dominance of ‘multicultural’ customers, the significance of the ‘city living’ supergroup becomes more apparent the closer to the city centre each store is located. This is made clear from the scenarios in north London as sites 2, 3, 4 and 5 become

more centrally located with each scenario. For example, the store in Harrow (Outer London) is estimated to attract around 10 per cent of customers from the ‘city living’ supergroup. However, the store in Hounslow (city centre) has a profile comprised of 45 per cent ‘city living’ households. Perhaps the most noticeable profile is the store from scenario 8 in Greenwich. The model outputs suggest this store will have a far more varied customer base which could be beneficial should consumers from the other groups (as seen in Yorkshire and the Humber) begin to trade down to the discount format. Additionally, the differences in demand between the regions strengthen the argument that store location strategy is a complicated process and differences in demand are of paramount importance (Birkin *et al.*, 2002; Thompson *et al.*, 2012).

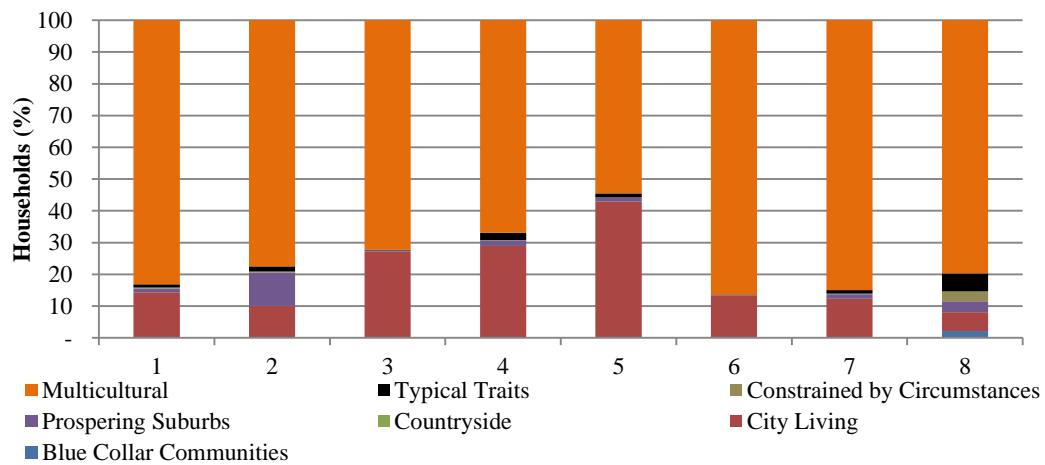


Figure 8.10. Customer profiles of scenario stores, London

Source: Vickers and Rees (2007)

Table 8.9 demonstrates the level of ‘switching’ behaviour between the main brands across each scenario. Firstly, due to the size of the proposed store in Harrow, this scenario results in the greatest increase of customers to Aldi, and thus has the largest impact on the local market (greater gravitational pull within the model). Interestingly, despite being smaller than those stores trialled in Yorkshire and the Humber, most of the stores (even the convenience formats) are expected to attract far more households. This is further evidence of the increased levels of demand in London and why the region is being targeted by Aldi and a number of the other grocery retailers. The most noticeable difference between the brand impacts in Yorkshire and the Humber is that the effect of an Aldi store is evident across far more brands. This is arguably because of the density of stores across the region. For example, in each catchment there are far more stores competing for the available customers (Figure 8.12). In most cases, Table 8.9 illustrates that it is Sainsbury’s and Tesco that will lose the most customers to a new Aldi store. This is not surprising considering they have the most expansive networks across the city. However, when this is represented as a proportion of total customers that shopped at each brand

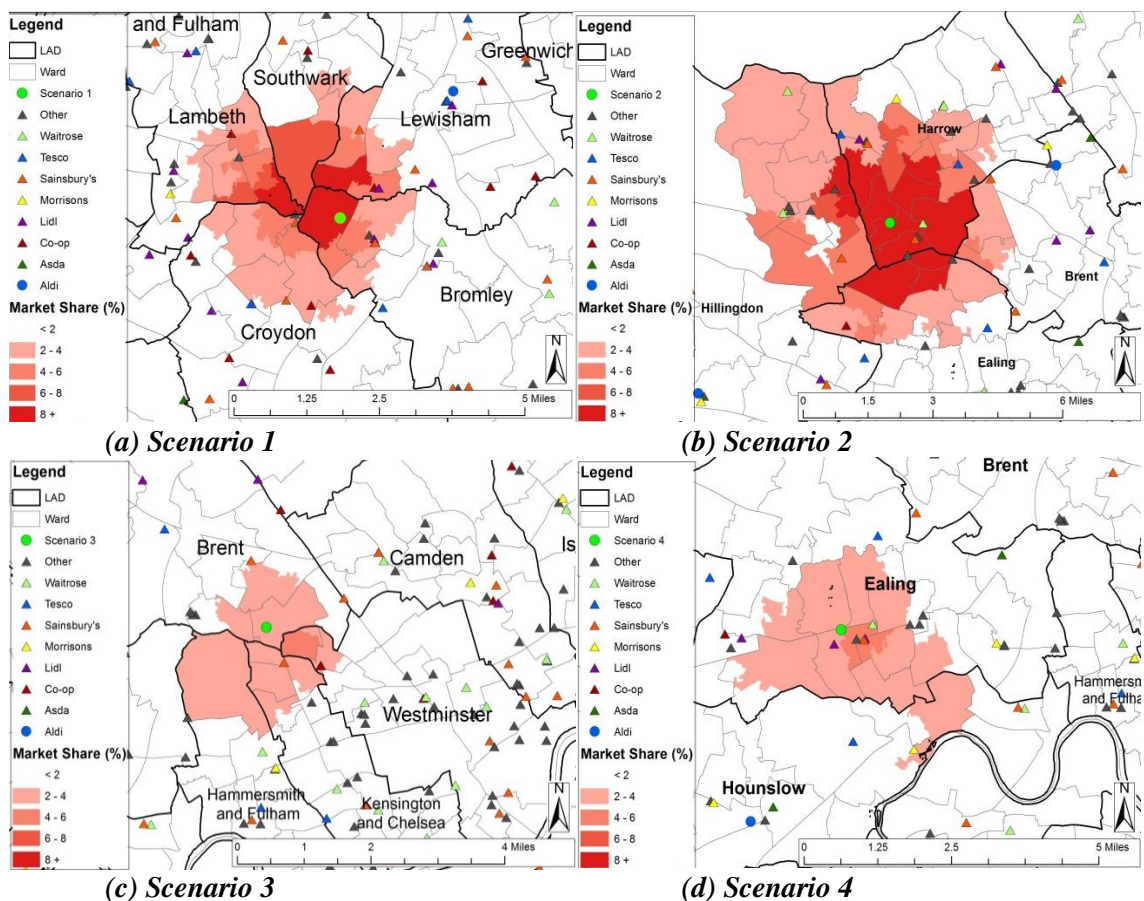
prior to the scenario being run, it is Lidl, Iceland and Budgens that are hit the hardest. This is because these retailers compete directly for the same customer base as Aldi,

Table 8.9. Brand impacts for individual scenarios, London

Scenario ID	1	2	3	4	5	6	7	8
Increase in Households								
Aldi	5,748	12,325	3,433	2,323	5,404	10,692	5,305	1,737
Asda	-254	-255	-255	-254	-520	-729	-377	-432
Budgens	-31	-338	-19	-22	-32	-216	-26	-10
Co-op	-323	-72	-107	-16	-28	-221	-314	-193
Farm Foods	-7	0	0	0	0	-19	-17	-4
Iceland	-156	-286	-44	-43	-73	-198	-126	-31
Lidl	-206	-159	-16	-63	-48	-184	-207	-50
Marks & Spencer	-72	-349	-236	-24	-112	-524	-53	-19
Morrisons	-398	-694	-248	-208	-804	-1559	-452	-220
Netto	-11	-298	-6	-14	-38	-44	-5	-6
Sainsbury's	-2,970	-4,938	-1,169	-593	-1,527	-3,413	-2,398	-372
Sainsbury's Local/Central	-33	0	-17	0	-2	-3	-33	0
Spar	0	0	0	0	0	0	0	0
Tesco	-1,096	-3,187	-554	-830	-1,308	-1,664	-1,115	-363
Tesco Metro/Express	-7	-87	-159	-59	-141	-538	-6	-5
Waitrose	-171	-1,660	-410	-187	-709	-814	-162	-31
Other	-14	-2	-193	-9	-62	-565	-13	-1
Total	0	0	0	0	0	0	0	0

Percentage Increase on Households								
Aldi	13.72	29.41	8.19	5.54	12.89	25.51	12.66	4.14
Asda	-0.06	-0.06	-0.07	-0.06	-0.13	-0.19	-0.10	-0.11
Budgens	-0.08	-0.93	-0.05	-0.06	-0.09	-0.60	-0.07	-0.03
Co-op	-0.35	-0.08	-0.12	-0.02	-0.03	-0.24	-0.34	-0.21
Farm Foods	-0.07	0.00	0.00	0.00	0.00	-0.19	-0.18	-0.04
Iceland	-0.27	-0.49	-0.08	-0.07	-0.13	-0.34	-0.22	-0.05
Lidl	-0.35	-0.27	-0.03	-0.11	-0.08	-0.31	-0.35	-0.08
Marks & Spencer	-0.06	-0.27	-0.18	-0.02	-0.09	-0.41	-0.04	-0.02
Morrisons	-0.14	-0.25	-0.09	-0.08	-0.29	-0.56	-0.16	-0.08
Netto	-0.11	-3.00	-0.06	-0.14	-0.39	-0.45	-0.05	-0.06
Sainsbury's	-0.31	-0.52	-0.12	-0.06	-0.16	-0.36	-0.25	-0.04
Sainsbury's Local/Central	-0.57	0.00	-0.29	-0.01	-0.03	-0.06	-0.56	0.00
Spar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tesco	-0.14	-0.40	-0.07	-0.11	-0.17	-0.21	-0.14	-0.05
Tesco Metro/Express	-0.01	-0.14	-0.25	-0.09	-0.22	-0.86	-0.01	-0.01
Waitrose	-0.06	-0.58	-0.14	-0.06	-0.25	-0.28	-0.06	-0.01
Other	-0.02	0.00	-0.32	-0.01	-0.10	-0.93	-0.02	0.00

In terms of the individual scenarios, the geographic model outputs are provided in Figure 8.11. The maps provide a useful visualisation of each store catchment and thus where households are likely to travel from. On account of the limited number of stores in the region, Aldi will have no problems meeting the ‘competition test’ set by the CC (2008). Once more the spatial patterns provide additional context to the brand impacts from Table 8.9. Tesco stores are frequently found in close proximity to each of the scenarios, so it is understandable why they stand to lose the most customers. This will be a worrying fact for the ‘big four’, as the growing popularity of Aldi is likely to result in further ‘switching’ behaviour as new stores continue to be built. The low-level market share estimates in Figure 8.11 also make for an interesting comparison to the scenarios in Yorkshire and the Humber. For instance, the catchments surrounding each of the stores are much smaller and far less uniform. This is a result of the increased number of competitors that Aldi have to compete with for customers.



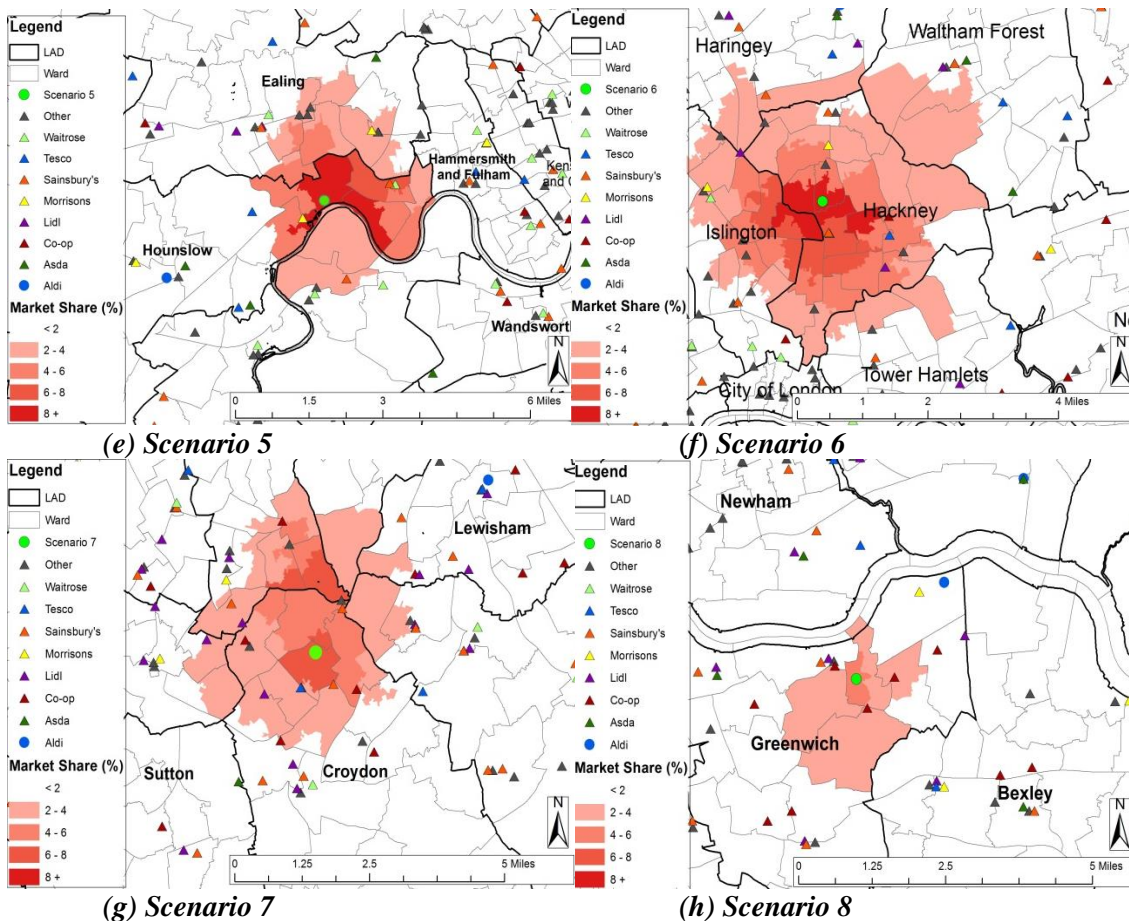


Figure 8.11. Individual scenario low-level market shares, London
 Source: GMAP Ltd (2012)

8.4.4 Store Forecast Model: Multiple Site Assessment

As in Section 8.3.4, the final piece of analysis will involve each of the London scenarios being run through the SIM in one batch. As explained, this is purely for hypothetical reasons, as it is understood that the other retailers will also be building new stores at the same time. Nevertheless, the results at least provide an insight into the rate at which Aldi will need to obtain new sites if it is realistic about reaching some of its more ambitious long-term targets. The aggregate figures are presented in Table 8.10, whilst the low-level market share figures are illustrated in Figure 8.12. On account of the performance of the new stores, Aldi is estimated to achieve a rate of growth in excess of 100 per cent, lifting its overall share of grocery spend to 2.49 per cent. This level of growth is much greater than that in London, although this would be expected given the multiple scenario assessment involves increasing the existing network by nearly 60 per cent. The greatest levels of impact appear to be on stores occupied by the former Netto. If any of these outlets are still being sold by Asda, they could provide a more cost effective option for a new site. Comparing the spatial pattern of Aldi's market share in Figure 8.12 against Figure 8.7, it is evident that the new scenarios will go some way to filling the gaps in the market. This is most visible in the centre of London, where the smaller convenience formats have been trialled. Nevertheless, even with the introduction of eight new sites, there are

still obvious locations towards the south west, south east, north and centre of the region that could be explored should they contain the necessary customer base. It is evidence such as this that makes it difficult to refute the statements that London does in fact offer obvious potential for the discounters to expand.

Table 8.10. Impact of multiple scenarios in London

	Growth in Revenue (%)	Final Market Share (%)
Aldi	109.74	2.49
Asda	-0.77	12.13
Budgens	-1.89	1.05
Co-op	-1.34	2.49
Farm Foods	-0.47	0.27
Iceland	-1.61	1.58
Lidl	-1.52	1.58
Marks & Spencer	-1.08	3.83
Morrisons	-1.62	8.05
Netto	-4.13	0.26
Sainsbury's	-1.78	29.36
Sainsbury's Local/Central	-1.49	0.16
Spar	0.00	0.00
Tesco	-1.25	23.71
Tesco Metro/Express	-1.58	1.73
Waitrose	-1.41	9.61
Other	-1.42	1.70
Total		100

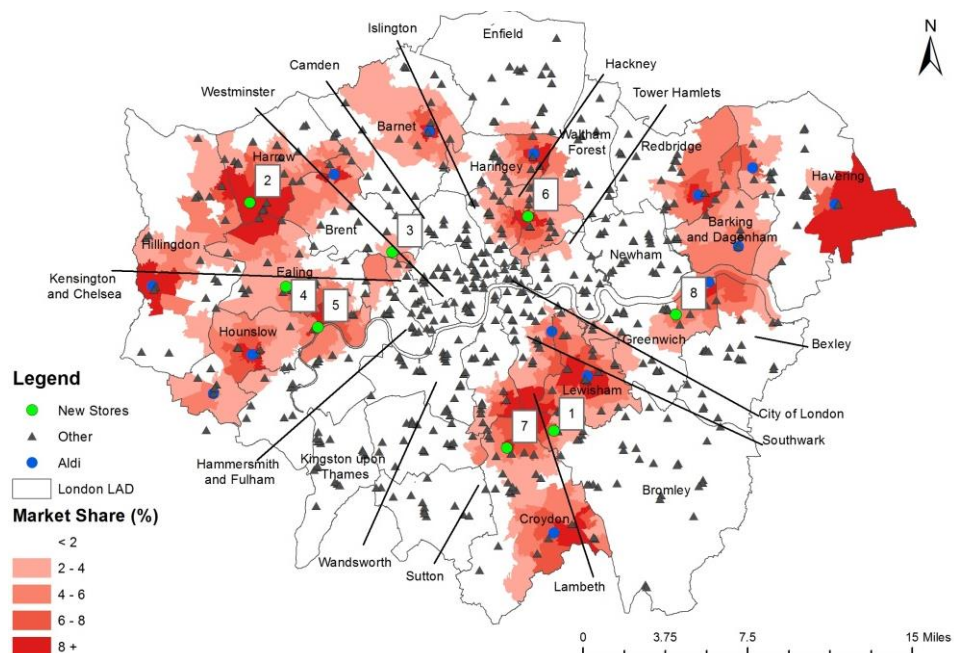


Figure 8.12. Multiple scenario low-level market shares, London
Source: GMAP Ltd (2012)

8.5 Additional Future Scenarios

Whilst the defined SIM has proven to be a useful tool in examining the performance of new Aldi stores in the British grocery market, the model has the capabilities to be used in many scenario formats for future analysis. First of all, there are a number of supply-side related scenarios that would provide interesting case studies for the grocery market moving forward in an era of recovery. For example, because the model was calibrated on observed data for all the major grocery retailers, it could just as easily be utilised for site assessments for any of the other retailers currently operating in GB. However, this is something which could also be achieved with some of the standard aggregate SIMs, although not to the same degree of accuracy. In relation to the changing dynamics of the grocery market and the recent trends which have been discussed in this thesis, an interesting area of research would be the growth of the convenience sector. It is noted that many of the smaller stores were removed from the previous analysis; however, the model would be capable of examining locations for stores of 3,000 to 4,000 square feet in size. Given the recent move of Morrisons into the convenience sector, the disaggregated SIM would be well placed in assessing the success of extending this format in each of the study regions (or other regions if data were provided). Morrisons has only added a select number of these formats to its network portfolio so could use the model to assess not only the performance of a new M-Local but also the types of consumer groups (OAC) these stores would attract.

In addition to the introduction of new stores to the region, the analysis could also be extended to look at the closure of underperforming stores and the amendment or refurbishment of current stores. This would be particularly useful for Tesco, as it has been stringently assessing its current store networks with the intent to downsize the number of stores it currently has across the UK (Chapter 5). As discussed, the market leader is also looking to re-locate underperforming stores and convert medium-size supermarkets into large Tesco Extras. In the context of the recent Mary Portas review of British high streets, it would be interesting to see how these large stores would perform and which retailers/stores would be worst affected. Moreover, organic growth is not the only way to increase market share. Since 2005, a number of retailers have expanded their store networks through mergers and acquisitions (see Chapter 3 and 5). Thus, it would be possible to run the SIM to examine the best-fit for selected retailers with regard to their market share. Similar attempts were made by Poole *et al.* (2003) for the proposed takeover of Safeway; however, this research only considered the distribution of floor space as an indicator for market share.

In contrast to the supply-side changes, the model also has the functionality to estimate the impact of fluctuations in demand. One of the more basic changes would be a rise in the population or households in certain areas. Since the recession, house sales have declined across

Britain, as buying a house has become difficult for some consumers. Consequently, the Government has promoted a number of schemes and pushed through a number of housing developments to kick-start the housing market (Hall, 2011; Jones *et al.*, 2012). In order to understand the likely impact of these new housing developments on the grocery market, demand in these areas could be inflated to account for the rise in the number of households. However, depending on the types of consumers introduced into the system (e.g. more deprived), retailers would be impacted upon differently.

Another potential scenario could be the level of ‘switching’ behaviour within the British grocery market – one of the primary themes explored throughout the thesis. The recession has caused a number of consumers to reassess their traditional shopping behaviour and subsequently bring their spending in line with the current economic climate. The result has been that certain consumers now place more importance on cost and quality than brand, a prime example being the rise of more affluent consumers shopping at the discounters which previously carried a stigma of a low cost and low quality. The opposite is also true in some cases, as evidence has also been provided for selected consumers groups which have actively reverted back to ‘trusted’ and prominent regional brands (Chapter 6). Consequently, if the level of brand loyalty were to decline or increase for certain households (OAC) and specific retailers, then the $W_j^{a^{kl}}$ matrix could be adjusted accordingly. For example, scenarios could be run to forecast the impact of Asda becoming more popular amongst households from the ‘multicultural’ OAC group. Asda is actively trying to gain more market share with ethnic minorities, so it would be interesting to explore the impact this would have on its market share should this trend continue.

Finally, linking into the behaviour of consumers and the pressures of the economic downturn, it is also possible to look at the influence of the distance or cost parameter in the SIM. It has been well documented in previous chapters that with rising inflation, rising fuel costs and rising unemployment, consumers are facing increased pressure to manage their household budgets. In particular, the rising cost of fuel and the growing popularity of the internet as a channel to market could have substantial impacts on the future of the British grocery market. In order to try and understand the impact of these changes on retailers in the grocery sector, the β function in the SIM could be adjusted to make the distance travelled more of a prominent factor. In some cases, this may not be as simple as increasing the β to produce tighter catchments around stores, as some shoppers may actively choose to visit large out-of-town stores that offer a wider range of products and services to reduce the number of linked trips they undertake.

8.6 Conclusion

On account of the documented success of the discounters and their ambitious growth plans over the next decade, the aim of this final analysis chapter has been to investigate potential growth opportunities for Aldi in two comparison regions – Yorkshire and the Humber and London. Initially, Aldi's current performance in each region was investigated through the provision of both aggregate market statistics and detailed spatial analysis. It was found that Aldi is well established in Yorkshire and the Humber, whilst London remains a region where the discount grocer has a limited supply of stores. Next, through a combination of information (spatial market share, competition, geodemographic profiling and population density), a variety of sites were then identified for further analysis in each region. In Yorkshire and the Humber, two sets of locations were researched. The first represented Aldi's traditional low-cost customer base in which it has built its foundations. In contrast, locations were also recommended for targeting the growth in more wealthy consumers brought about by the recession. In London, Aldi's customer profile has remained more stable since 2004; therefore no differentiation was assigned to the selection of potential sites. It is felt that this detailed low-level spatial profiling provides a major contribution to the retail geography literature, as it is something which has not been presented in the field to date (exception of Thompson *et al.*, 2012). Finally, the validity of each scenario was then tested by operationalising a disaggregated SIM to estimate the likely impacts on revenues and market share in each region. In Yorkshire and the Humber, the results illustrated that there is still potential for future growth in the traditional low-cost areas. Moreover, there are further opportunities should Aldi consider a potential expansion into 'middle' Britain, moving the focus from deep discounting to serving more middle markets (a potential change in the value-platform growth strategies through which the discount grocer now seems to be championing). The proposed sites in London also showed that despite the large number of food stores in the capital, Aldi still has a great deal of room for future development. Additionally, London may provide a key region for potential growth if Aldi is to meet its target of a 10 per cent market share by 2020.

Finally, whilst the analysis has provided a useful insight into the potential expansion for one grocery retailer, the future for the grocery market remains unclear in some respects. However, if the retailers are to succeed in what is undoubtedly a dynamic market; retailers will need to be more proactive and develop sophisticated methods to aid their site location strategies. As discussed in Section 8.5, whether it is identifying new sites for expansion, consolidating existing stores networks, predicting the impact of population growth or changes in consumer behaviour (brought about by economic shocks), SIMs will continue to provide a practical tool for assisting locational decision making aimed at increasing corporate turnover and profitability.

Chapter 9

Conclusions

9.1 Introduction

The work reported in this thesis has successfully addressed the aim set out in the introduction: to quantify the impact of the recession on the British grocery market both from a consumer (demand side) and a retailer (supply side) perspective. In completing this research there have been a number of specific achievements: a detailed historical documentation of the recession and the long-term structural trends impacting upon retailing in Great Britain (GB); the validation of data from Acxiom's Research Opinion (ROP) survey, a unique and previously unused (in academia) commercial dataset designed to capture local trends in consumer behaviour; a much needed updating of the work surrounding the location strategies and spatial monopolies of the major multiples in the food retail sector; the production of household grocery spend estimates over time for selected demographic and socioeconomic groups; a clarification of the behaviour of different households in the management of grocery expenditure, preferred brand choice and online penetration through the recession; the construction of a novel Spatial Interaction Model (SIM) that disaggregates the flow of households depending on specified consumer-retailer relationships; and the application of the SIM to cast light on the potential growth opportunities in the British grocery market, specifically the discount sector.

This chapter concludes the thesis by summarising the main research findings and achievements, addressing first in Section 9.2 the seven specific objectives laid out in Chapter 1. Section 9.3 will then address some of the limitations of this piece of research through a critique of the methodology employed, before Section 9.4 reflects on the successes and limitations of the thesis and suggests a possible research agenda for the future.

9.2 Summary of Findings

In the introduction to this thesis, the broad aim was set to quantify the impact of the recession on the British grocery market both from both consumer (customer or demand side) and a retailer (provider or supply side) perspectives. This aim would be met through addressing a series of research questions, formulated into a set of objectives; this section will now take each of these objectives in turn and demonstrate how each was met through the research carried out within the thesis.

- 1. To review and gain a comprehensive understanding of the extensive literature surrounding the recession, long-term trends in the British grocery sector and the characteristics that drive consumer behaviour.**

This objective was accomplished over the course of two chapters (Chapters 2 and 3). First of all Chapter 2 provided an appraisal of the literature relating to GB in recession, offering a complete discussion of the workings of the entire economic downturn and its impacts on retailing. Initially, considerations were given to the origin and development of the global financial crisis, thus documenting the contributing factors that initiated the recession. It was found that whilst a collapse in the sub-prime mortgage industry was the main trigger, a host of other factors (despite government intervention) were at work relating to the deregulation of financial markets and the interconnectedness of the global economy. The wider economic impacts were also explored in conjunction to those effects witnessed in the food retail market. It was found that the recession became associated with uneven patterns of unemployment (age, gender, industry and geography), a restriction of credit, falling house prices and rising inflation. The combination of these impacts led to increased levels of consumer uncertainty, as households actively searched for ways to reduce expenditure (even on essential items such as food). It is believed that new shopper ground rules have emerged, as consumers have begun to break from their established routines, seeking a mixture of quality, value and values. The fallout from the recession has led many commentators to refer to this most recent period of decline as the 'Great Recession'. However, an historical comparison in Chapter 2 found that recessionary events are not as discontinuous or unique as they sometimes seem, with the literature categorising synergies with those recessions of the past. Additionally, whilst there is an ever growing body of literature surrounding the causes and macroeconomic impacts of the recession in GB, the literature was found to lack a detailed subnational examination of the impacts on different types of consumers in retailing (especially the grocery market).

Therefore, in order to supplement the detailed review of the recession, Chapter 3 explored the principal drivers of consumer behaviour and the structural trends at work in the grocery market. It illustrated that retailing institutions and practices are essentially evolutionary in nature, and much can be learned by studying the history of retailing. Modern retailing is the accumulation of incremental steps over time, and the state of retailing at any given point is not only dependent on the current nature of the overall economy but also on specific factors endemic to retailing. In particular, the global financial crisis has exposed forces of more general change in retailing – population change (ageing, single person households and ethnic composition), increased market concentration, the progressive rise of online retailing, the shift to a convenience culture, complex regulation of out-of-town development and internationalisation. The review of the

grocery market up to and including the twenty-first century found these drivers to be highly complex and closely interrelated concepts. However, once again, a gap in the literature was highlighted concerning the analysis of such factors at a subnational level across GB.

The combination of the two chapters in addressing the second objective highlighted the need for geographers to move away from a one-dimensional account of the recession and grocery retailing. Consequently, it was stressed that future work should attempt to understand economic shocks in relation to the multi-dimensional and conflicting perspectives of governments, regulators, retailers and consumers.

2. To undertake an assessment of the methodological techniques used for grocery expenditure estimation and low-level market share estimates.

On account of the multitude of data used in this thesis (aggregate and micro-level), a number of different methodologies have been exploited. Therefore, rather than provide a single chapter documenting the development of one specific technique, methods have been reviewed and critiqued within the chapters reporting the research to which they have been applied. For instance, various curve estimation techniques were highlighted in Chapter 6 for harmonising inconsistencies in categorical data over time. Whilst a number of models were explored, nonlinear regression was argued to be the most appropriated option for modelling detailed information from grouped grocery expenditure data by income, age and other household variables. This is because nonlinear regression offers the potential for substantive interpretability of parameters and the associated scope for comparison of curves over time and space – exemplified through its constant use across a range of disciplines.

In terms of methodologies associated with the calculation of low-level market share estimates, Chapters 3 and 6 highlighted some of the more descriptive techniques that are often applied. In particular, insights were provided on the relevance of using floorspace indicators as measures of market share and saturation in the grocery sector – concluding that they can be often too simplistic or even misleading. Consequently, Chapter 7 was directed at performing a thorough review of the more sophisticated techniques used in retail geography. More specifically, a systematic appraisal of the theory of spatial interaction was provided, a theory derived from Newtonian gravitational principles which states that the level of interaction between two bodies is a function of their size and the distance between them. Initially, considerations were given to the history of SIM, explaining how, in particular, developments following on from the work of Wilson (1970, 1971) have led to the successful specification of models which have been used to explain and predict interaction flows in a variety of contexts. Building on the more general theoretical aspects of SIMs, Chapter 7 also focused upon issues of calibration, the limitations of

SIMs, alternative methodologies and the application of SIMs in retailing. It is understood that an array of techniques could be utilised; however, it was established that SIMs offer demonstrable benefits in generating robust revenue predictions at low levels of geography. In the context of retail planning, although conditions in the real world present a number of important challenges for shopping models, the literature demonstrated that SIMs have consistently been robust enough to deal with these challenges.

3. To validate Acxiom's Research Opinion Poll (ROP) data against existing data sources concerning household expenditure and customer patronage.

A large proportion of the data provided in this thesis has been made available through collaboration with Acxiom Ltd – initiated by the Economic and Social Research Council (ESRC) and its Retail Industry Business Engagement Network (RIBEN). Through this relationship, the thesis has directly benefited from access to valuable industry data sources, particularly the use of Acxiom's Research Opinion Poll (ROP) – a large scale household survey aimed at recording local patterns in consumer behaviour across GB. Academics tend to be sceptical about commercial datasets that are collected and processed by private sector organisations – doubting their provenance and preferring the comfort of using data from well-established sample surveys or censuses. Yet there are ever growing volumes of unofficial data being captured through a number of channels by different organisations which, with shrinking public sector funds and the possible abolition of the next UK census of population, will become increasingly useful for social science research. Therefore, before the ROP dataset could be used for 'serious research' in an academic context, a thorough review and evaluation of the data was provided in Chapter 4.

The initial analysis reported in Chapter 4 examined the range of official data sources available to researchers seeking to explore patterns in the food retail market. For instance, reflections were given on the suitability and availability of geographical boundary data, area classifications, household surveys, business surveys, market data and retail locations (grocery store) data from GMAP Ltd. Then, focusing specifically on tackling objective four, the qualities and limitations of the data provided by Acxiom Ltd were scrutinised in the remainder of the chapter. To guarantee a complete independent assessment, a framework was devised using associated literature and the structure specified by the ONS for exploring commercial data sets as part of its 'Beyond 2011' programme. More specifically, through certain exploratory analysis, the review was able to cover issues of question range, sample size, bias, geographic detail and record linkage. Overall, the results were favourable, as the ROP data demonstrated consistent trends with other data sources and outperformed different sample surveys on question range (inclusion of income and expenditure variables, sample size and geographic detail) – although limitations

were raised with regard to a notable bias towards older generations and an underrepresentation of young and wealthy respondents in the data. Finally, in assessing the robustness of the data, binary logistic regression models explored the likelihood of households spending more than £50 a week on groceries, controlling for a range of explanatory variables (age, income, tenure, household size). Compared against an equivalent set of models using data from the Living Cost and Food Survey (LCF), the results demonstrated that the ROP data provided consistent and thus reliable conclusions about the significance of the relationship between selected independent variables and weekly grocery spend in the British grocery market.

Overall, despite the documented shortcomings, there is no doubting that the ROP provides an excellent source of up-to-date information on consumer behaviour and expenditure patterns, with considerable potential for use in academic research. By helping to reshape our understanding of a wide range of human behaviours (especially in grocery retailing), the data have the potential to help formulate long-term policy decisions in a wide range of areas across the social sciences. On this basis, it is very likely that commercial data sources such as Acxiom's ROP will become ever more apparent in social science research.

4. To provide an up-to-date assessment of the major supply-side changes in the British grocery sector since the start of the twenty-first century.

Following the literature reviews in Chapters 2 and 3, a clear gap in the current literature was identified regarding the subnational expansion of the grocery retailers in GB since the beginning of the twenty-first century. Therefore, in an attempt to cover this research gap, Chapter 5 addressed major supply-side (retailer) trends in British grocery retailing from 2002 to 2012. In particular, levels of competition, saturation, internationalisation and e-commerce were found to be crucial aspects of retail market dynamics when assessing future market development.

Initially, an assessment of the wider economy highlighted both the strength of the retail market and, in particular, the food sector (with the exception of independent retailers) in terms of employment and business survival. The recession in GB has clearly had an impact on consumer behaviour as households are scrutinising their expenditure and ensuring they get best value for money by switching to different retailers. Tesco, for example, has struggled for the first time in years, losing market share to Sainsbury's, Morrisons, the discounters and Waitrose. The market has become polarised by consumers seeking more affordable low-cost grocery products (benefiting the discounters) and those spending more money on premium lines (benefiting Waitrose and Sainsbury's). Building on this more commonly investigated aggregate analysis, subnational breakdown at Local Authority District (LAD) level highlighted how the grocery market is synonymous with regional market concentration. More specifically, improving on

some of the more simplistic indicators of provision, low-level market share estimates revealed leading firms are still geographically concentrated, suggesting that common references to saturation are overly simplistic – even for Tesco. Furthermore, subnational floorspace-per-household indicators illustrated that there may even be under-provided markets of food provision across GB (particularly in the South East) that will be able to support further expansion by grocery retailers in the future.

In dealing with the documented pressures on retailing identified through objective one, it was also found that grocery retailers have adapted by experimenting with different store formats, internationalising their operations and adopting online retailing. For example, exploration into changing store formats showed that a continued construction of large hypermarkets (despite pressure from the Competition Commission) and an overwhelming increase in the number of convenience stores is pushing medium-sized supermarkets out of the market (not a recessionary trend) – impacting substantially on independents and symbol groups. The failure by Tesco in America, an experienced investor in overseas markets, also revealed many foreign economies have suffered from the lingering effects of recession – signifying that internationalisation is not always a profitable option. Finally, despite the regularly documented threat of the internet on retailing, online sales (especially in the grocery sector) still represent a relatively low proportion of overall sales. Nonetheless, due to the underlying geographic trends in internet access (higher in city urban centres and rural extremes), growth rates are expected to vary substantially.

5. To illustrate the impact of the recession on consumer behaviour with regards to varying demographic, socioeconomic and low-level geographic characteristics.

First of all, so to place the impact of the recession on consumers in the grocery market in wider economic context, comparisons were made in Chapters 5 and 6 across all aspects of household expenditure. After taking into account the effects of rising inflation, the analysis illustrated a clear reduction in overall spending – although the effects were less profound in the grocery sector compared to non-essential areas of consumption such as tourism and recreational activities. At the same time, it was shown that households have not abandoned their ethical and moral beliefs on healthy foods, as today's consumers have become increasingly more aware of what constitutes a healthy diet. Furthermore, new insights into the pattern of grocery expenditure and retailer demand were also gleaned from analysing changes at the LAD level across GB. In particular, the use of Vickers and Rees (2007) classification illustrated that both grocery expenditure and retail demand have a distinct spatial pattern that goes beyond the regional level.

Supplementing the more aggregate analysis, by making use of micro-data from of Acxiom's ROP, quantification the effects of the recession on consumers by their demographic, socioeconomic and geographic characteristics was presented in Chapter 6. In responses to commentators that predicted a worsening in the 'north-south' divide, local geographic comparisons were also provided for two comparative regions; Yorkshire and the Humber and London. This exploration of consumer characteristics identified that not all consumers have responded in the same manner. More specifically, analysis of grocery expenditure data over time demonstrated increased levels of modification, a possible consequence of the austerity measures which have impacted heavily on pensions. Due to the importance of this demographic group (ageing population) in the food market, it is perceivable to suggest that the reduction in spending by this demographic group may have helped pushed Britain into recession. The regional comparisons (Yorkshire and the Humber and London) also shed interesting light on the geographic variations of expenditure, as those in more rural areas were found to promote higher levels of expenditure – arguably a result of growth in out-of-town supermarkets.

In the context of customer patronage, the research has provided a unique contribution to the literature with regard to retailer specific consumer profiles. A number of household types were shown to demonstrate sophisticated strategies for economic shopping, utilising a wide range of brands to purchase food. In particular, evidence was provided for increased brand loyalty in older consumers in Yorkshire and the Humber, whilst London was found to offer a more competitive environment. In addition, the 2008 recession has caused certain households to break from their established routines and seek quality (Waitrose), value (discounters) and values (fresh food). As discussed, this has led to a polarisation in the market whereby the discount retailers and premium brands such as Waitrose have begun to take market share from the 'big four', leaving them stranded in middle ground – similarly to that which occurred in the 1990-93 recession. However, whilst it cannot be denied that these retailers have benefited from a certain level of 'switching' behaviour (especially discounters), analysis revealed growth can also be accredited to new stores being introduced to the system.

Finally, in studying the role of e-commerce, it was found the characteristics of online grocery shoppers are complex, particularly in urban areas where socioeconomics and demographics can override accessibility effects. However, consistent with much of the literature, online consumers are most likely to be men aged 25-44, affluent, and living in city centres. Moreover, whilst e-commerce did originally diffuse out from London and the main cities, it is no longer just an urban trend. There is evidence of increasingly high usage in rural areas due to improved broadband services (Chapters 5 and 6) and decreasing proximity to nearby stores. In terms of the recession, the evidence was inconclusive, although there were suggestions that the internet may offer a counter-recessionary mechanism in searching for low-cost alternatives.

6. To build on existing methods and develop techniques for the estimation of grocery expenditure and spatial market share estimates.

On account of the different types of data utilised in the thesis (micro, aggregate and interaction) a range of methodologies were implemented. First of all, in order to add a greater level of sophistication to the comparative analysis in Chapter 4, binary logistic regression was used to investigate the likelihood of households spending more than £50 a week on groceries, controlling for a range of explanatory variables (age, income, tenure, household size). Although logistical regression has been used in this manner before, the research offered new insights into what drives household spending through the inclusion of income and geodemographic classifications as explanatory variables. Expanding on the logistic regression outputs, Chapter 6 illustrated the process (nonlinear regression) for dealing with time-series inconsistencies in categorical data. As such, it was possible to harmonise grocery expenditure data (by a range of independent variables) between 2005 and 2012. Primarily used in the field of demography, the application of nonlinear curve estimation in this setting proved an innovative but effective methodology to enable grocery spend estimates to be adjusted for rising inflation – something which was crucially important for analysis through the recession.

The most considerable contribution to this objective was the production of a disaggregated SIM by the 2001 Output Area Classification (OAC) in Chapter 7, with the capability to accurately predict the flow of households and thus market share from low-level origin zones to individual grocery outlets – reinforcing the need to move away from the more aggregate SIMs so that the variations in consumer behaviour can be captured more accurately. In terms of the model itself, a major advancement was the facilitation of consumer-retailer relationships that make certain stores (depending on the brand) more attractive to specific consumers (OAC). The inclusion of the 2001 OAC also provided a unique way of bringing together the patterns associated with consumer behaviour from Chapter 6, as outputs from the calibration of distance decay parameters highlighted varying trip distances undertaken by different consumers – especially between Yorkshire and the Humber and London. The application of a scorecard (incorporating brand, accessibility and agglomeration) to produce the W_j parameter of a given store also tackled some the issues raised by Birkin *et al.* (2010) regarding the attractiveness of destinations in spatial interaction modelling. Additionally, the ROP data used for calibration also offered considerable advantages over traditional sources of retail interaction data, facilitating the opportunity to calibrate flows across all brands in the market rather than just one which is often the case (see Newing *et al.*, 2013).

7. To offer recommendations on potential growth opportunities in the British grocery market through utilising a disaggregated SIM.

The final objective of the thesis was to consolidate the analysis of previous chapters through offering a methodology that assesses growth opportunities in the grocery market. Chapter 8 addressed this objective by utilising the disaggregated SIM developed in Chapter 7. Whilst a number of different scenarios could have been examined (demand or supply related), due to the documented success of the discounters in Chapters 3, 5 and 6 and their ambitious growth plans over the next decade, Chapter 8 investigated potential growth opportunities for Aldi in Yorkshire and the Humber and London. Yorkshire and the Humber was associated with two growth strategies, both taking into account the saturation debate: whether there is still room for expansion in traditional and well established markets; and whether changing consumer profiles since the recession have opened up new areas of growth which previously would have been unprofitable. London was also acknowledged as a key area for growth, both as part of Aldi's location strategy and the fact there remains substantial untapped demand (Chapter 5).

After assessing current market conditions in each region, potential sites were located through low-level geodemographic spatial profiling, a novel approach which has not been presented in the field to date (Thompson *et al.*, 2012). The validity of each location (Aldi store) was then tested by operationalising the disaggregated SIM (in either region) to estimate the flow of households, market share, cannibalisation and 'switching' behaviour between brands. The chapter concluded by revealing that there is still potential for future growth in markets such as Yorkshire and the Humber despite concern over market saturation. Moreover, there are further opportunities for growth should Aldi (or the other discounters) consider a potential expansion into 'middle' Britain, moving the focus from deep discounting to serving more middle markets (a potential change in the value-platform growth strategies through which the discount grocer now seems to be championing). The proposed sites in London also showed that despite the large number of food stores in the capital, increased population growth over the last decade (Chapter 5) means there is still considerable room for future development.

9.3 Some Limitations

This thesis has advanced both the understanding of the British grocery market in recession and the processes involved in achieving this understanding, but in spite of these successes there are some inevitable issues with the methodological approach which, whilst noted in various places within the thesis, should be acknowledged explicitly here.

Throughout the thesis, a range of data sources have been drawn upon depending on the geographic scale and detail of analysis required. Nevertheless, there still remain a number of data issues that must be recognised. For example, the thesis has utilised certain aggregate data to

demonstrate trends and patterns through the recession, leading to possible generalisations to occur. The Modifiable Area Unit Problem (MAUP) and the ecological fallacy have already been discussed, but it is worth reiterating that the LAD unit of analysis in Chapter 5 means that spatial generalisations are being made – meaning it would be ill-advised to attempt to apply these aggregate observations to alternative resolutions. In addition, although attempts have been made to ensure the most recent data have been applied in this thesis, there has been the unavoidable use of certain datasets which could be deemed as out-of-date. The most notable have been the use of the 2001 OAC and the Vickers *et al.* (2003) classification of LADs. Whilst the benefits and ultimate justification for utilising both classifications were detailed in Chapter 4, the classifications were constructed using data from the 2001 Census – data which are a snapshot of the population at this time. The further away from this point in time, the less likely the particular situation recorded by the 2001 Census remains applicable. Even though populations are likely to remain stable over time (Orford *et al.*, 2002; Dennett, 2010), there is some inevitable variation. Therefore, it could be argued that the use of these classifications must be treated with caution, especially the further one gets from 2001.

Other criticisms can also be made in relation to the methodological elements of the thesis. For example, although the analysis in Chapter 4 (logistical regression) and Chapter 6 provided an original insight into the behaviour of consumers (disaggregated by a range of independent variables) in the grocery market, much of the analysis was exploratory and descriptive in nature. For example, many populations of interest in social science have a multi-level structure. If we ignore the structure and use a single level model, our analyses may be partially flawed because we have ignored the context in which processes may occur (Hung *et al.*, 2012). Therefore, it may have been more appropriate to adopt a multilevel modelling technique, allowing for variations in a dependent variable to be assessed at several levels simultaneously – making it possible to explore variations in grocery spending or retailer choice by household income (level one), geography (level two) and time (level three).

Finally, a number of improvements could be also made to the SIM methodology constructed in Chapter 7. First of all, whilst it was argued that modelling the flow of households rather than expenditure allowed for an insight into the level of ‘switching’ behaviour between brands, households were not treated as whole numbers (not rounded) to prevent a loss of data. In cases where flows must be treated as integers (e.g. school catchments) these losses of data are commonly reflected in the overall total number of flows, appearing as though the model has ‘lost people’. Therefore, rather than simply treat households as decimals, techniques such as those described by Ballas *et al.* (2005) and Harland (2008) could have been employed to eliminate rounding errors so that households in the model could have been preserved as whole numbers. Secondly, so to identify city centre grocery stores (work-based population) and those

closely surrounded by competitors (agglomeration effect), a scorecard methodology was applied in Chapter 7 to improve the flow of households to stores of this nature. Despite providing increased improvements against standard SIMs that simply use store size for attractiveness parameters, it is recognised that the availability of more sophisticated techniques could be used as the basis for the criticism of any models which do not take full account of these patterns. For example, elements from Fotheringham's (1983) 'competing destinations' model could have been applied to improve the accuracy of flows to clustered retail locations or shopping centres. Additionally, similar to Newing *et al.* (2013) who documents the need for an additional layer of tourism demand, the model in London could have benefited from a work-flow population layer, as it is known that many consumers in the capital perform small and more regular grocery trips after work (growth in convenience shopping). Furthermore, whilst the SIM provided a valuable insight into the potential of selected sites for the introduction of a new Aldi store, no consideration was given to the availability of land or the cost of land in the recommended site. Therefore, the robustness of this research might be usefully improved through the detailed empirical examination of the local planning regulations, land availability and the spatial variations in land cost – especially in London.

9.4 Future Agenda for Research

There are several research directions in which this project could be extended. First of all, the subnational analysis of grocery trends throughout the thesis has revealed considerable spatial variation in provision levels at regional and local scales. Such variation cannot be overlooked when assessing levels of competition and may provide the key to greater understanding of retailer expansion patterns. Consequently, the assessment of market saturation and retail concentration provided in Chapter 5 could be extended for additional retailers or even for international markets the major British multiples have expanded into. Due to the pressures impacting on the British market, many retailers have turned to foreign markets for avenues of growth. Therefore, it would be interesting to witness the extent to which grocery retailers have managed to penetrate these markets. Furthermore, small-scale analyses of competition and market dominance are also increasingly becoming an integral part of regulatory authorities' controls on competition levels. Taking this work forward, using small-scale approach to determine growth typologies in local markets, is just one of the suggestion that has been made regarding avenues for future exploration by researchers in this field .

One of the most obvious avenues for future research is to make the SIM accessible to grocery retailers or policy makers. On account of the challenges associated with location planning and the multitude of pressures impacting on retailing, the defined SIM has the scope to offer increased value to the strategies employed by location planning teams across GB. Wood and Reynolds (2011) note than in many retail organisations, location planning may represent an

individual or very small team attached to a property or marketing department, lacking the necessary resources and planning tools. Therefore, the SIM would offer clear benefits in assessing market potential that would be otherwise extremely difficult. For instance, despite of being suitable for a number of traditional scenarios (Section 8.5), an interesting question remains as to whether e-commerce provides access to a different set of customers for a particular retailer or merely serves existing face-to-face customers more comprehensively. If this question can be answered through extending the SIM framework then many retailers could better understand the importance of e-commerce in capturing new sales. It would also help them decide on suitable distribution strategies for growth in areas of low market share; new stores versus 'virtual' stores (sometimes called dot.com or even 'dark' stores) serving internet customers from distribution depots. Coupled with the kind of geodemographic analysis provided here on consumer usage of e-commerce, this would provide a powerful framework for incorporating e-commerce fully in the retail distribution chain.

Finally, this research has largely been carried out from the perspective of the major grocery retailers. However, some of the findings and conclusions could be usefully applied to research undertaken from a public-sector or consumer perspective. For example, identification of areas of low grocery-retail provision could be taken as opportunity for local authorities to positively encourage retailers to expand in underprovided markets – as a way of tackling 'food deserts'. Furthermore, on account of the highly publicised independent review into the future of our high streets by Portas (2011), it would seem that future work in retailing (and thus grocery retailing) is being focused towards the reshaping of British high streets. Nevertheless, it has been established that these forces (economic downturn and long-term structural trends) are very complex and so it is suggested that future academic research has to look beyond the traditional confines of retail geography. More specifically, it is recommended that further relationships are formed with retailers, retail practitioners and planners so to adopt an interdisciplinary approach that seeks research findings in a context of real world significance.

9.5 Concluding Remarks

This thesis has quantified trends in the British grocery sector through a period of substantial economic decline, developing our understanding of the patterns and processes in existence at the local level at a time when there is a continuing need to understand the wider effects of retail change. There is, of course, research still to be continued, methods honed, techniques to be improved and new patterns to be observed with every passing year, but this work has succeeded in unravelling some of the complexities inherent in the British grocery market at this time. It is hoped that through the commercial application and novel approaches described in this work, those who will inevitably want to make similar sense of future patterns of grocery spending, market concentration and saturation (both in Britain and further afield), will now have the tools

to assist them in achieving those ends. It is hoped that such work will further improve the quality of geographical interpretations of retail dynamics, encouraging further calibrations with retail practitioners and enable empirical work to be integrated with theoretical perspectives.

APPENDIX A - ROP Survey Extract

Research Opinion Poll

Instructions	Coffee	Home Improvements																																																																																																																								
<p>1 Please tell us the products and services you and your family use by marking a dark '✓' in the appropriate boxes.</p> <p>2 For each category '✓' as many boxes as apply (try to keep ticks small so they do not run into other boxes).</p> <p>3 If a category is not used in your home or you would prefer not to answer a specific question, please tick the 'no' box or just leave the question blank.</p> <p>4 Please return to us in the pre-paid envelope provided - and don't forget our extra prize draw for M&S hampers if you return your survey within 7 days.</p> <p><i>Thank you very much for your help</i></p> <p>EXAMPLE We usually shop at Asda and occasionally Morrisons. I would '✓' boxes as follows:</p> <p style="text-align: center;">Groceries</p> <p>1 Where do you shop for groceries?</p> <table border="0"> <tr> <td><input type="checkbox"/> Aldi</td> <td><input type="checkbox"/> Morrisons</td> </tr> <tr> <td><input checked="" type="checkbox"/> Asda</td> <td><input checked="" type="checkbox"/> Netto</td> </tr> <tr> <td><input type="checkbox"/> Budgens</td> <td><input type="checkbox"/> Sainsbury's</td> </tr> </table>	<input type="checkbox"/> Aldi	<input type="checkbox"/> Morrisons	<input checked="" type="checkbox"/> Asda	<input checked="" type="checkbox"/> Netto	<input type="checkbox"/> Budgens	<input type="checkbox"/> Sainsbury's	<p>1 How many cups of instant coffee do you drink at home each day?</p> <p><input type="checkbox"/> 5+ <input type="checkbox"/> 3-4 <input type="checkbox"/> 1-2 <input type="checkbox"/> Less <input type="checkbox"/> None</p> <p>2 Which of the following instant coffee brands do you drink on a regular basis?</p> <table border="0"> <tr> <td><input type="checkbox"/> Carte Noire</td> <td><input type="checkbox"/> Nescafé Original</td> </tr> <tr> <td><input type="checkbox"/> Douwe Egberts</td> <td><input type="checkbox"/> Nescafé Gold Blend</td> </tr> <tr> <td><input type="checkbox"/> Kenco</td> <td><input type="checkbox"/> Nescafé Parisien</td> </tr> <tr> <td><input type="checkbox"/> Kenco Pure</td> <td><input type="checkbox"/> Maxwell House</td> </tr> <tr> <td><input type="checkbox"/> Kenco Rappor</td> <td><input type="checkbox"/> Supermarket's Own Brand</td> </tr> </table> <p>3 When buying your instant coffee which of the following do you consider?</p> <table border="0"> <tr> <td><input type="checkbox"/> Organic</td> <td><input type="checkbox"/> Price/Promotion</td> </tr> <tr> <td><input type="checkbox"/> Premium</td> <td><input type="checkbox"/> Health</td> </tr> <tr> <td><input type="checkbox"/> Decaf</td> <td><input type="checkbox"/> Ethically Sourced</td> </tr> </table>	<input type="checkbox"/> Carte Noire	<input type="checkbox"/> Nescafé Original	<input type="checkbox"/> Douwe Egberts	<input type="checkbox"/> Nescafé Gold Blend	<input type="checkbox"/> Kenco	<input type="checkbox"/> Nescafé Parisien	<input type="checkbox"/> Kenco Pure	<input type="checkbox"/> Maxwell House	<input type="checkbox"/> Kenco Rappor	<input type="checkbox"/> Supermarket's Own Brand	<input type="checkbox"/> Organic	<input type="checkbox"/> Price/Promotion	<input type="checkbox"/> Premium	<input type="checkbox"/> Health	<input type="checkbox"/> Decaf	<input type="checkbox"/> Ethically Sourced	<p>1 Would you consider any of these home improvements?</p> <table border="0"> <tr> <td></td> <td>Yes</td> <td>Possibly</td> <td>Already Here</td> </tr> <tr> <td>Conservatory</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Conservatory Blinds</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Fascias, Guttering, Cladding</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Patio Awnings</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Replacement Windows/Doors</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Interior Window Shutters</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Interior Window Blinds</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>New Sofas</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <p>2 If you receive state benefits or credits of any kind you may qualify for a government heating grant this winter. Please tick if you'd like to receive more information:</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3 You may be entitled to a Government backed cavity wall or loft insulation grant, please tick to learn more and arrange a no obligation survey:</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>		Yes	Possibly	Already Here	Conservatory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Conservatory Blinds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fascias, Guttering, Cladding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Patio Awnings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Replacement Windows/Doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Interior Window Shutters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Interior Window Blinds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	New Sofas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																														
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<p style="text-align: center;">Groceries</p> <p>1 Where do you shop for groceries?</p> <table border="0"> <tr> <td>01 <input type="checkbox"/> Aldi</td> <td>10 <input type="checkbox"/> Morrisons</td> </tr> <tr> <td>02 <input type="checkbox"/> Asda</td> <td>11 <input type="checkbox"/> Netto</td> </tr> <tr> <td>03 <input type="checkbox"/> Budgens</td> <td>12 <input type="checkbox"/> Sainsbury's</td> </tr> <tr> <td>04 <input type="checkbox"/> Co-op</td> <td>13 <input type="checkbox"/> Sainsbury's Local/Central</td> </tr> <tr> <td>05 <input type="checkbox"/> Farm Foods</td> <td>14 <input type="checkbox"/> Somerfield</td> </tr> <tr> <td>06 <input type="checkbox"/> Iceland</td> <td>15 <input type="checkbox"/> Tesco</td> </tr> <tr> <td>07 <input type="checkbox"/> Lidl</td> <td>16 <input type="checkbox"/> Tesco Metro/Express</td> </tr> <tr> <td>08 <input type="checkbox"/> Spar</td> <td>17 <input type="checkbox"/> Waitrose/Ocado</td> </tr> <tr> <td>09 <input type="checkbox"/> Marks & Spencer</td> <td>18 <input type="checkbox"/> Other</td> </tr> </table> <p>2 From the list above please write the number of your MAIN supermarket: <input style="width: 40px;" type="text"/></p> <p>3 Do you shop online for groceries?</p> <p><input type="checkbox"/> Often <input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Would consider</p> <p>4 What do you spend on groceries a week?</p> <table border="0"> <tr> <td><input type="checkbox"/> Up to £35</td> <td><input type="checkbox"/> £50-£69</td> <td><input type="checkbox"/> £100-£149</td> </tr> <tr> <td><input type="checkbox"/> £36-£49</td> <td><input type="checkbox"/> £70-£99</td> <td><input type="checkbox"/> £150+</td> </tr> </table> <p>5 Where is your main grocery store located?</p> <p><input type="checkbox"/> In Town/City Centre <input type="checkbox"/> Out of Town</p> <p><i>(Please write in town/city name or out of town location)</i></p>	01 <input type="checkbox"/> Aldi	10 <input 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type="checkbox"/>	Community	<input type="checkbox"/>	<input type="checkbox"/>	<p style="text-align: center;">Insurance</p> <p>1 When do you renew the following insurance policies?</p> <p>Home contents: (please estimate if unsure)</p> <p><input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec</p> <p>Buildings: (please estimate if unsure)</p> <p><input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec</p> <p>2 Have you changed your insurance company in the last three years?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3 How do you prefer to buy your insurance?</p> <p><input type="checkbox"/> Online <input type="checkbox"/> In Shop <input type="checkbox"/> Telephone/Post</p> <p style="text-align: center;">Household</p> <p>1 Which of the following laundry products</p>
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- a) Digital Boundary Data used in all maps have been provided with permission of use from the United Kingdom Boundary Outline and Reference Database for Educational and research Study (UKBORDERS).
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<http://ukdataservice.ac.uk/>

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