

Adaptive decision making in multi-stakeholder retail planning

Citation for published version (APA):

Janssen, I. I. (2011). *Adaptive decision making in multi-stakeholder retail planning*. [Phd Thesis 1 (Research TU/e / Graduation TU/e), Built Environment]. Technische Universiteit Eindhoven.
<https://doi.org/10.6100/IR712686>

DOI:

[10.6100/IR712686](https://doi.org/10.6100/IR712686)

Document status and date:

Published: 01/01/2011

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.tue.nl/taverne

Take down policy

If you believe that this document breaches copyright please contact us at:

openaccess@tue.nl

providing details and we will investigate your claim.

Adaptive Decision Making in Multi-Stakeholder Retail Planning

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de
Technische Universiteit Eindhoven, op gezag van de
rector magnificus, prof.dr.ir. C.J. van Duijn, voor een
commissie aangewezen door het College voor
Promoties in het openbaar te verdedigen
op dinsdag 26 april 2011 om 16.00 uur

door

Ingrid Isabel Janssen

geboren te Eindhoven

Dit proefschrift is goedgekeurd door de promotoren:

prof.dr. H.J.P. Timmermans
en
prof.dr.ir. W.F. Schaefer

Copyright © 2011 I.I. Janssen
Technische Universiteit Eindhoven
Faculteit Bouwkunde, REM&D

Cover design: Bert Lammers, Tekenstudio Faculteit Bouwkunde
Printed by the Eindhoven University of Technology Press Facilities

BOUWSTENEN 153

ISBN 978-90-6814-636-3
NUR code 955

ACKNOWLEDGEMENTS

About 10 years ago I decided to change my brand new business career for an academic one. From real estate manager, I returned to the university, hoping to be able to grasp opportunities for personal development. One of the first things that hit me was that the real estate world was a lot larger than I had ever imagined. This gave me a lot of new ideas to teach and, more importantly, a lot of new things to learn myself. From the start, the variety of models explaining retail locations interested me the most. Sometimes complicated, sometimes simple in nature, but overall these models were not compatible with my own experiences. In practice I realized that planning and development of real estate is a people's business. I believe that this particular experience formed the basis of the initial idea for this study. Eventually, my ambition was to contribute to state-of-the-art knowledge on location decision-making by investigating the way people (stakeholders in the retail real estate sector) do business (make decisions). I am proud of having fulfilled my personal ambition, but of course this result would not have been possible without the help of others.

First of all, I want to thank John Nijsten, former director of RVM Vastgoedmanagement. He offered me my first job and introduced me into the world of retail real estate. I don't think he ever understood my motivation for becoming an academic. Nevertheless, he always kept in touch and supported me in his own characteristic way.

Looking for a methodology to approach my research ideas, it was Aloys Borgers who shared his wisdom and knowledge with me and doing so, he motivated me to dig deep and reach out. From our first talk, my PhD-project was a really exciting journey embracing new software and modeling techniques. I am really grateful to Aloys for his immense support during this project. He was always available for pep talks, confirmation of the path we were on, discussing problems and a critical and precise look at my work.

Many thanks also to Harry Timmermans for giving me the opportunity to carry out this research under his supervision. From the start of my academic career we shared the same interest in retailing, although from different angles. Working together with him helped me to switch my professional attitude to an academic one. His encouragement, his advice and his ability to look ahead were of great value to me. Special thanks also to Wim Schaefer for his contributions and personal advice mostly reaching further than this study.

Special thanks to Joran Jessurun for his support on developing the data-collection tool. Also thanks to Jolanda Mensen for assisting me with the data-collection. And, of course, thanks to all my colleagues from the Real Estate Management group for their support. I can imagine my research was vague for you from time to time, especially when I decided to work at home. This strategy, however, allowed me to create some distance from the great number of students within our group and made it possible to finish this thesis.

Many times I have asked myself why I ever started a PhD. I wrote my research proposal during my maternity leave just before the birth of my youngest daughter, absolutely not knowing what to expect. If other young mothers ask me for advice for sure I can tell them one thing: Combining a PhD-project, a full-time job as an assistant professor and a household is completely impossible without a 200% supporting partner. Wilfred, without you I wouldn't have had the smallest chance of finishing this thesis. Thank you very much!

The final words of these acknowledgements are for my two daughters. Just like my patient husband, I really admire their patience. For me, these past six years have been a long period. For them it has been a complete lifetime. It has not been easy to explain to them what I was doing on our attic all the time. A short while ago both Anne and Nora learned to read. They even learned some English words, so I could show them my book on the computer. Especially the last twelve months mum's "boekje" was big excuse for many things we did not do together. Well, Anne and Nora, the book is finally finished! Let's enjoy!

Ingrid Janssen

Waalre, February 2011

TABLE OF CONTENTS

| | |
|--|-----------|
| <i>ACKNOWLEDGEMENTS</i> | i |
| <i>LIST OF FIGURES</i> | ix |
| <i>LIST OF TABLES</i> | xi |
| | |
| 1 INTRODUCTION | 1 |
| 1.1 Background | 1 |
| 1.2 Objectives and research approach | 3 |
| 1.3 Outline | 4 |
| 2 SHIFTED ROLES IN RETAIL PLANNING | 7 |
| 2.1 Introduction | 7 |
| 2.2 Retail planning in a historical context | 8 |
| 2.2.1 Retail planning in the Netherlands..... | 8 |
| 2.2.2 Retail planning in other Western European countries..... | 14 |
| 2.2.3 Changed planning philosophies..... | 14 |
| 2.3 The retail planning problem | 15 |
| 2.3.1 Changes in consumer behaviour..... | 16 |
| 2.3.2 Changing demand retailers..... | 19 |
| 2.3.3 Property market circumstances..... | 21 |
| 2.4 Different perspectives to retail planning decisions | 23 |
| 2.4.1 The planner's perspective..... | 23 |
| 2.4.2 The developer's perspective..... | 27 |
| 2.4.3 The retailer's perspective..... | 29 |

| | | |
|------------|--|-----------|
| 2.4.4 | Other stakeholders involved | 30 |
| 2.5 | Conclusion..... | 31 |
| 3 | <i>DECIDING ON NEW RETAIL PLANS.....</i> | 33 |
| 3.1 | Introduction..... | 33 |
| 3.2 | The retail planning process | 34 |
| 3.2.1 | Policy documents and legal instruments | 35 |
| 3.2.2 | Plan realization: the retail development initiative..... | 36 |
| 3.3 | Case studies | 38 |
| 3.3.1 | Plein Westermaat te Hengelo..... | 39 |
| 3.3.2 | NL-C Geldermalsen | 41 |
| 3.3.3 | Tilburg Mall..... | 43 |
| 3.3.4 | Reflection | 44 |
| 3.4 | Conclusions | 45 |
| 4 | <i>MULTI-ACTOR DECISION MAKING AND ADAPTIVE BEHAVIOR.....</i> | 47 |
| 4.1 | Introduction..... | 47 |
| 4.2 | Multi-actor decision making theory | 48 |
| 4.2.1 | Cooperative versus non-cooperative decisions..... | 49 |
| 4.2.2 | Group decisions: a framework..... | 51 |
| 4.3 | Understanding influence structures..... | 53 |
| 4.3.1 | Classification of interactions | 53 |
| 4.3.2 | Power relations and interactions | 54 |
| 4.3.3 | Cooperative versus competitive negotiation behaviour..... | 57 |
| 4.3.4 | Adaptive behaviour | 59 |
| 4.4 | Modelling preferences and adaptive behaviour..... | 59 |
| 4.4.1 | Multi-actor decisions and choice modelling..... | 60 |
| 4.4.2 | Using a conjoint experiment..... | 61 |
| 4.5 | Conclusions | 63 |

| | | |
|----------|---|-----------|
| 5 | <i>MEASURING ADAPTIVE BEHAVIOR</i> | 65 |
| 5.1 | Introduction | 65 |
| 5.2 | Basic principles of choice modelling | 66 |
| 5.2.1 | Random utility models | 66 |
| 5.2.2 | The Multinomial Logit model | 68 |
| 5.2.3 | The Mixed Logit model | 69 |
| 5.3 | Measurement approach | 71 |
| 5.3.1 | Construction of a conjoint choice experiment | 71 |
| 5.3.2 | Data preparation | 73 |
| 5.4 | Measuring adaptive behaviour | 74 |
| 5.5 | Validity | 78 |
| 5.6 | Conclusions | 79 |
| 6 | <i>A CONJOINT EXPERIMENT TO MEASURE ADAPTIVE BEHAVIOR</i> | 81 |
| 6.1 | Introduction | 81 |
| 6.2 | Retail planning decisions as a choice task | 81 |
| 6.3 | An instrument for data-collection | 84 |
| 6.3.1 | The advantages of a Web-based experiment | 85 |
| 6.3.2 | Visualizing attributes and levels | 86 |
| 6.3.3 | Designing a Web-based questionnaire | 89 |
| 6.3.4 | Testing the Web-based questionnaire | 91 |
| 6.4 | Conclusion | 92 |
| 7 | <i>DATA-COLLECTION, RESPONSE RATES AND RESPONDENT PROFILES</i> | 93 |
| 7.1 | Introduction | 93 |
| 7.2 | Data-collection | 94 |
| 7.2.1 | Sample size | 94 |
| 7.2.2 | Selection and invitation of respondents | 94 |
| 7.3 | Characteristics of respondents | 96 |

| | | |
|------------|---|-------------------|
| 7.3.1 | Developers | 96 |
| 7.3.2 | Retailers..... | 99 |
| 7.3.3 | Local governments | 101 |
| 7.4 | Conclusion..... | 103 |
| 8 | <i>ANALYSES AND RESULTS.....</i> | <i>105</i> |
| 8.1 | Introduction..... | 105 |
| 8.2 | Base model to measure retail plan preferences..... | 106 |
| 8.2.1 | Preparing preference variables | 107 |
| 8.2.2 | Introducing interaction variables | 108 |
| 8.2.3 | Introducing context variables..... | 109 |
| 8.3 | Estimation procedure..... | 111 |
| 8.4 | Model estimation preferences stakeholders..... | 112 |
| 8.4.1 | Main effects | 112 |
| 8.4.2 | Interaction effects | 116 |
| 8.4.3 | Context effects | 117 |
| 8.5 | Model estimations including adaptive behaviour..... | 118 |
| 8.6 | Model estimations including differences within each group of stakeholders..... | 124 |
| 8.6.1 | Model estimations including subsamples developers | 125 |
| 8.6.2 | Model estimations including subsamples retailers | 127 |
| 8.6.3 | Model estimations including subsamples local governments..... | 131 |
| 8.7 | Likelihood ratio tests..... | 1375 |
| 8.8 | Discussion and conclusion | 137 |
| 9 | <i>CONCLUSIONS AND DISCUSSION.....</i> | <i>141</i> |
| 9.1 | Short summary of the study..... | 141 |
| 9.2 | Conclusions | 142 |
| 9.3 | Discussion and future research..... | 146 |

BIBLIOGRAPHY..... 149

APPENDIX 1 Screen plots electronic survey..... 169

AUTHOR INDEX..... 179

SUBJECT INDEX..... 185

SUMMARY 189

CURRICULUM VITAE..... 195

LIST OF FIGURES

| | | |
|------------|---|-----|
| Figure 2.1 | Scale-enlargement in the Dutch retail landscape (source Locatus, 2010) | 20 |
| Figure 2.2 | Return rates different property categories (source IPD Nederland, 2010) | 22 |
| Figure 2.3 | Spiral of decline (source Guy, 2007) | 25 |
| Figure 2.4 | Planning based on compensation | 26 |
| Figure 3.1 | Retail development plans flowing through development stages (x 1.000 m ² GLA) (source NEPROM, 2009) | 38 |
| Figure 3.2 | Picture Plein Westermaat | 40 |
| Figure 4.1 | Perspectives on decision making | 49 |
| Figure 4.2 | Influence structures and preference formation | 52 |
| Figure 5.1 | Example of a conjoint choice set | 71 |
| Figure 6.1 | Map of imaginary city “Shop City” | 82 |
| Figure 6.2 | Icons used to present retail categories | 88 |
| Figure 6.3 | Example choice task first part experiment | 90 |
| Figure 6.4 | Example choice task second part experiment | 90 |
| Figure 8.1 | Differences in part-worth utilities type of retailers (MNL model) | 129 |
| Figure 8.2 | Differences in part-worth utilities based on store size (MNL model) | 131 |
| Figure 8.3 | Differences in part-worth utilities subsamples based on number of citizens local governments (MNL model) | 135 |

LIST OF TABLES

| | | |
|------------|--|-----|
| Table 2.1 | Characteristics Dutch retail stock 2010 (source Locatus, 2010) | 11 |
| Table 2.2 | Impacts of new peripheral retail developments: planner's perspective | 24 |
| Table 2.3 | Impacts of new peripheral retail developments: developer's perspective | 29 |
| Table 2.4 | Impacts of new peripheral retail developments: retailer's perspective | 30 |
| Table 4.1 | Essentials games and negotiations (based on Raiffa, 2002) | 50 |
| Table 5.1 | Dummy coding | 73 |
| Table 5.2 | Example coded choice set | 73 |
| Table 5.3 | Example I, coded choice set with adaptation effect | 75 |
| Table 5.4 | Example II, coded choice set with adaptation effect | 75 |
| Table 5.5 | Example III, coded choice set with adaptation effect | 76 |
| Table 5.6 | Coded choice set with adaptation variables | 76 |
| Table 6.1 | Selected attributes and levels | 84 |
| Table 7.1 | Response rates experiment | 96 |
| Table 7.2 | Sample characteristics developers | 97 |
| Table 7.3 | Specialism by international focus | 98 |
| Table 7.4 | Experience by international focus developers | 98 |
| Table 7.5 | Sample characteristics retailers | 99 |
| Table 7.6 | Type retail organization by scale shop format (frequencies) | 100 |
| Table 7.7 | Retail trades in the sample | 101 |
| Table 7.8 | Sample characteristics representatives local governments | 101 |
| Table 7.9 | Experience municipality with out-of-town retail decisions | 102 |
| Table 7.10 | Size municipalities in sample compared to actual number in the Netherlands | 102 |

| | | |
|------------|--|-----|
| Table 7.11 | Involvement by size municipality | 103 |
| Table 8.1 | Coding of retail plan attributes | 108 |
| Table 8.2 | Coding scheme interaction variables | 109 |
| Table 8.3 | Coding dataset for base model | 110 |
| Table 8.4 | Estimated parameters developers (including preference, interaction and context variables) | 113 |
| Table 8.5 | Estimated parameters retailers (including preference, interaction and context variables) | 114 |
| Table 8.6 | Estimated parameters local governments (including preference, interaction and context variables) | 115 |
| Table 8.7 | Estimated parameters developers (including interaction, context and adaptation variables) | 121 |
| Table 8.8 | Estimated parameters retailers (including interaction, context and adaptation variables) | 122 |
| Table 8.9 | Estimated parameters local governments (including interaction, context and adaptation variables) | 123 |
| Table 8.10 | Estimated parameters developers (including interaction, context, adaptation and sample variables) | 126 |
| Table 8.11 | Estimated parameters retailers (including interaction, context, adaptation and sample variables) | 128 |
| Table 8.12 | Estimated parameters local governments (including sample variables representing the number of citizens) | 133 |
| Table 8.13 | Estimated parameters local governments (including sample variables representing personal involvement in retail planning decisions) | 134 |
| Table 8.14 | Likelihood ratio test developers' models | 136 |
| Table 8.15 | Likelihood ratio test retailers' models | 136 |
| Table 8.16 | Likelihood ratio test planners' models | 136 |

CHAPTER 1

INTRODUCTION

1.1 Background

Land use planning in the Netherlands has been increasingly more entrepreneurial and development oriented and less administrative. Until the 1980's, land use planning in the Netherlands was controlled by municipal, provincial, and national authorities. This classical planning approach has been gradually complemented and replaced by participatory, public-private partnership, integrated development processes (e.g. Nijkamp, Van der Burch & Vindigni, 2002; Priemus, 2002; Klijn & Teisman, 2003) As a consequence, authorities have to cooperate with market parties that entered the land market and are actively involved in plan generation in order to acquire new investment opportunities. Thus, location decisions are now being made in the wider context of stakeholder interactions. This change in planning approach implies changing roles of stakeholders who jointly have become responsible for the full development process (e.g. Healey, 1998; Priemus, 2007; Buitelaar, 2010).

With respect to the planning of retail facilities the Dutch Government used to have a strong hand in determining the program and location for new shopping centres. However, in line with the more general shift in planning, within retail planning market parties have obtained a prominent position. With the introduction of the newest national policy document on spatial planning, the so called "Nota Ruimte" (VROM, 2004), the Dutch government decided to relax restrictions for all retail categories to be located at peripheral locations. Furthermore, with this new policy the responsibility for planning decisions is deputed to local governments. This stimulated shopping centre developers and other parties involved in retail planning to get involved in peripheral retail development. Thus at present time, planners meet real estate

developers and retail firms on a local (municipal) policy level to jointly decide on the location of new retail facilities or the restructuring or enlargement of existing shopping areas.

Previous studies on retail location decisions produced theories and models from the viewpoint of a single stakeholder making independent decisions. A broad variety of models have been developed to support planners to make better decisions regarding the spatial distribution of shopping centres (e.g. Oppewal, 1995; Arentze, Oppewal & Timmermans, 2005; Dennis, 2005; Borgers, Van Swaaij & Janssen, 2006) or the distribution of shops within shopping centres (e.g. Reimers & Clulow, 2004; Borgers, Brouwer, Kunen, Jessurun & Janssen, 2010). The common ground of these studies is that they are based on extensive research on consumer (choice) behaviour. Other retail location models are based on realistic assumptions of the behaviour of retail firms (e.g. Oppewal, Louviere & Timmermans, 2000; Hernandez & Biasiotto, 2001). The findings of these studies may assist stakeholders who actually have to decide on new retail property development, although, the decision behaviour of planners and real estate developers themselves is neglected so far within location decision models. This is surprising because eventually retail developments are the result of the combined actions of planners on the one hand and market parties on the other.

The growing awareness that location decisions are determined to a greater or lesser extent by a variety of underlying economic, social and political processes involving multiple stakeholders with different goals and interests, has led to new approaches in the field of retail planning. As opposed to the decision models based on the behaviour of consumers or retail firms, these approaches are descriptive in nature. Among others Brown (1992) and Guy (1994) argued the need for these descriptive approaches to explain how decision makers mutually decide on retail development. This resulted in few studies focussing on a descriptive analysis of retail planning and development processes. Pal, Bennison, Clarke & Byrom (2001) explored ways in which major retailers have sought to influence government policy formulation by using policy networks. However, the influence of these networks on location decisions at the local (municipal) level is underexposed in this study. In another study, Evers (2004) focused on the spatial outcome of decisions by adapting an institutional framework to describe the development of out-of-town shopping centres in three major cities in Europe. Although these descriptive approaches shed light on the present complex decision making environment, a quantitative analysis of multi-stakeholder decision behaviour in retail planning is still lacking. An analysis of this behaviour

should help to understand preferences of stakeholders and influence structures while negotiating on retail plans. This study attempts to contribute to this gap in the literature by collecting data on decision behaviour of stakeholders involved in retail planning in the Netherlands.

1.2 Objectives and research approach

The aim of this study is to reveal preferences of stakeholders deciding on new retail locations for a particular city. It provides insight into preferences for the location of different retail categories of different stakeholder groups. Typical for decision processes in retail planning is that they often take many years, can be split in multiple negotiation rounds and often result in a break-down. Consensus is not always the case, explicitly not if the differences between the objectives of the stakeholders are too big to reach agreement. However, during the decision making process stakeholders interact (negotiate and / or share information) and may influence each others viewpoint with the intention to reach consensus. Besides revealing stakeholders' preferences, a second purpose of this study is to investigate how a stakeholders' decision influence other stakeholders' decisions. To what extent do they adapt their preference when faced with the preferences of other stakeholders? Adaptive behaviour in this context of multi-actor decision making reflects the phenomenon that a decision maker adjusts his/her preferences towards the preferences of other decision makers in order to reach consensus.

Since it is difficult to collect revealed data on retail location decisions, we invited stakeholders to participate in a choice experiment. An advantage of using an experiment is that the context of the decision making process can be controlled and that data allowing econometric modelling can be collected for a clearly specified decision problem. Experimental research with real professionals as the decision makers is rather unique in the field of real estate research and retail planning. To guarantee the commitment of stakeholders with the experiment a Web-based instrument was developed for collecting choice data. Traditional choice modelling techniques were extended to measure adaptive behaviour. In that sense, this study also contributes to the state-of-the art in modelling multi-actor decision making.

1.3 Outline

In order to achieve the research objectives, this thesis is organized as follows. Chapter 2 describes how roles have shifted in retail planning based on a literature review. It gives a historical overview of Dutch retail planning policies and places the Dutch situation in the wider West-European context. Also, the current retail planning problem is spelled out, taking into account the continuously changing environment, and the different perspectives of stakeholders involved in retail planning. The purpose of this chapter is to offer an overview of the Dutch retail decision making context.

Chapter 3 takes a closer look at the process of decision making with respect to retail planning. It provides insight in formal planning procedures, legal instruments and the retail real estate development process. The reconstruction of the decision making process of three peripheral retail development initiatives in the Netherlands shows how interactions between decision makers influence preferences and eventually the final decision outcome.

Subsequently, Chapter 4 discusses the principles underlying multi-actor decision making. It explains how interactions between decision makers, group members and the broader decision context influence the preferences of decision makers and eventually the decision outcome. As a result of these interactions, each stakeholder may adapt his/her preferences towards the preferences of other decision makers. To be able to explain this adaptive behaviour, this chapter also gives – based on a literature review - insight in the motives underlying adaptive behaviour including power relations, differences in interests and perceptions.

In the remaining chapters of this thesis, adaptive behaviour as defined in Chapter 4 will be subject of an experiment where three stakeholder groups (developers, retailers and local governments) have to decide on the most preferable retail plan for improving the retail structure of an imaginary city. The purpose of this experiment is to identify and measure adaptive behaviour and to test whether incorporating adaptive behaviour into models explaining stakeholders' decision making behaviour improves the performance of these models. Also, the experiment provides insight into stakeholder preferences regarding the location of retail categories.

Chapter 5 argues how choice modelling techniques can be used for measuring stakeholders' preferences and adaptive behaviour. It shows how traditional conjoint experiments can be extended to collect data on adaptive behaviour. This chapter also shows how choice models can be extended to model such behaviour. Chapter 6 explains the design of the experiment in detail. It motivates how and why a Web-based instrument was developed to collect data on decision behaviour. The data-collection procedure will be explained in Chapter 7. Moreover, this chapter gives insight into the responses and the characteristics of the respondents. The results of the experiment are analyzed and discussed in Chapter 8. Two different discrete choice models were specified to estimate the effects of stakeholder interaction on choice behaviour. One model account for taste heterogeneity within stakeholder groups while the other model does not. Finally, the last chapter summarizes and discusses the conclusions of this study. It ends with recommendations for future research.

CHAPTER 2

SHIFTED ROLES IN RETAIL PLANNING

2.1 Introduction

The development of retail facilities has always been a topic of planning discussions in the Netherlands. Since the Dutch national government decided to abolish her restrictive retail planning regulations in 2004, public and private parties have been exploring the possibilities for new retail development. Especially the question whether and / or what to develop at peripheral locations has been subject of considerable debate. Compared to other countries, retail planning in the Netherlands has always been restrictive. The increasing dominance of the real estate development industry and the search for ways to facilitate the demand for innovative, large-scale retail concepts have been the main reasons for changing retail policy.

The purpose of this chapter is to provide insight in the current Dutch retail planning task. It describes how roles in retail planning have shifted and the consequences of this new situation for different stakeholders involved in retail planning. The chapter starts with a brief historical overview of retail planning in the Netherlands. Findings for the Dutch situation will be placed in the wider West-European context and in more general shifts in planning philosophies. The next section (section 2.3) explains the retail planning problem in more detail. Retail planning decisions have to be made in a continuously changing environment. In this section, the most important dynamics are described. Finally, section 2.4 highlights the impacts of retail planning decisions from the perspective of different stakeholders. The chapter ends with a conclusion.

2.2 Retail planning in a historical context

This section firstly provides a brief historical overview of retail planning policies in the Netherlands from the second half of the previous century until recently. Furthermore, a comparison is made with retail planning policies in other Western European countries. Finally, it shows how shifts in retail planning regulations in the Netherlands fit in a more general tendency of shifting planning approaches.

2.2.1 Retail planning in the Netherlands

The Dutch retail structure can be characterized as intricate, fine-woven, and hierarchically differentiated. After the Second World War, central place theory (Christaller, 1966) was used as a rationale for retail planning in the Netherlands. Christaller argued that, given an even distribution of a distance-sensitive population, distribution centres of varying size and located at central points will emerge to service this population, depending on the goods involved. As a consequence, the spatial structure of shopping centres in urban areas follows a functional hierarchical pattern with a relatively large number of small-scale shops per capita concentrated in urban areas (e.g. Borchert, 1998; Evers, 2002). New centres were allowed only if they were seen as not competing with (but being complementary to) existing centres. Until recently, this restrictive planning policy, dictated by the National Government, protected the existing Dutch retail structure. The development of out-of-town shopping areas was limited in scope. That is why large retail concepts like hypermarkets, factory outlet centres, big boxes and retail parks were almost absent from the Dutch retail structure (e.g. Evers, 2002; Jannette Walen, 2005). Also fully enclosed shopping malls have only emerged at a relatively small scale, mainly in Dutch city centres.

A proposal to build a “Maxis” hypermarket in Muiden, a small town about 15 km east of Amsterdam, suggested in the 1970’s, challenged this restrictive planning system for the first time. This development induced the national Government to accept rules to halt peripheral retail developments (Evers, 2002). The new policy implemented in 1973 was called “PDV-policy”. It explicitly restated the hierarchical principle as the desired policy line for retail and still did not allow any new shops to be built outside of designated centres. As an exception to this general

rule, only a few retail categories were allowed to locate outside existing shopping areas at locations specifically designated as so-called “PDV-locations” (Weltevreden, Atzema & Frenken, 2005). In 1973, only retailers selling explosive or flammable merchandise, cars, boats and caravans were permitted at PDV-locations. In 1984, firms selling furniture, do-it-yourself (DIY) and building materials were added to this list of products, which, like cars, boats and caravans, require a considerable amount of floor space. As a result of this policy, furniture strips became a common retail concept in the Netherlands. The PDV-policy has had a varying success. On the one hand, it prevented unwanted retail settlement in peripheral areas. On the other hand, due to the disappearance of boundaries between retail categories, more types of merchandise were sold at peripheral locations, which led to increased competition with the city centre (Borchert, 1998). In 1993, the restrictive policies were relaxed again by the introduction of so-called “GDV-locations” for stores exceeding 1500 square metres of gross floor space. Permission to create this new type of retail location was only granted to 13 cities which were awarded a special status as an urban growth pole in the Fourth Physical Planning Report Extra (VROM, 1991). These new opportunities for large scale peripheral retailing were met with enthusiastic responses from real estate developers and some retail firms.

Although PDV and GDV-policies allowed more retail development at peripheral locations, they still were restrictive. The experience with this policy was not in all respects satisfactory. While it prevented the undesired off-centre developments in rural areas, the Ministry of Economic affairs started the discussion to change the retail planning regime (EZ, 2000). Two important reasons caused this discussion. First, the regulation caused confusion concerning the definition of the retail categories that were allowed at peripheral locations. Second, it was felt that the former restrictive policy had been mainly directed at preventing certain developments from taking place, while instruments were lacking to stimulate desired developments (Van der Krabben, 2009a).

With the introduction of the first version of the newest national policy document on spatial planning (VROM, 2001), the Dutch government decided to relax restrictions for all retail categories to be located at peripheral locations. With this new legislation the Dutch government tried to stimulate innovation in the retail landscape and to anticipate the rapidly changing retail system. Also, with this new policy the responsibility for planning decisions was deputed to local governments. When the (expected) effects of a development go beyond the boundaries of the

municipality, the regional government has a steering role. After the new national policy document on spatial planning was discussed by the Dutch Lower Chamber, the document was adjusted a few times. The most important addition concerning retail planning is that new retail locations may not be at the expense of the existing retail structure¹ (TK 2004-2005). This amendment led to guidelines jointly compiled by the regional governments in order to set minimum requirements for new peripheral retail developments in terms of retail categories and scale (IPO, 2006). Eventually, the final version of the policy document on spatial planning, called “Nota Ruimte” (VROM, 2004) was approved by the Lower Chamber in 2006.

The policy vacuum that was created between 2000 and 2006, due to the long procedure to decide on the new document on spatial planning, gave room to the real estate development industry to initiate new peripheral retail plans. During this period, several large scale retail projects were initiated (but not always actually realized) by market parties. In addition the first factory outlet centres appeared in the Dutch retail landscape during this period (Jannette Walen, 2005). Table 2.1 gives an impression of the current Dutch retail stock. The traditional retail structure with inner cities supported with neighbourhood centres in different scale classes covers the most retail stock. Both, “Big Box Retail Parks” and “Specialty centres” are peripheral located. The number of other (peripheral) shopping areas is relatively low, although it has increased from 16.8 % in 2003 (Locatus, 2003) to 19,2 % of the retail floor space in 2010. Due to restrictions in the past, furniture became the most important retail category established at the peripheral “Big Box Retail Parks” in the Netherlands. In this thesis, this type of retail park is called a Furniture Strip.

Since the new document on spatial planning was approved, and regional guidelines were laid down, the main difference between the former centralized planning model and the present decentralized model is that the provinces are now responsible for enforcing planning rules, while that used to be the national government’s job. Meanwhile, the provinces have developed region-specific policies. Nevertheless, the Dutch retail planning system is still restrictive. Rules about retail categories that are allowed to be located at peripheral locations are open to discussion. It may be expected that the newest policy document will lead to new innovative retail development initiatives in the near future.

¹ TK 2004-2005, 29435, nr. 121, motion Van Bockhove C.S.

Table 2.1 Characteristics Dutch retail stock 2010 (Locatus, 2010)

| Type of shopping area | Number of shopping areas | Total net floor space (m2) | Share of total floor space |
|---|---------------------------------|-----------------------------------|-----------------------------------|
| City centres and town centres | 955 | 10.345.245 | 57,1% |
| City centres (> 400 outlets) | 17 | 1.892.831 | 10,4% |
| Regional centre large (200-400 outlets) | 40 | 2.147.280 | 11,9% |
| Regional centre small (100-00 outlets) | 84 | 2.159.472 | 11,9% |
| Subregional centre large (50-100 outlets) | 166 | 2.120.982 | 11,7% |
| Subregional centre small (5-50 outlets) | 635 | 1.997.710 | 11,0% |
| Subregional convenience centre | 30 | 26.970 | 0,1% |
| Supporting centres | 1.269 | 4.300.954 | 23,7% |
| Inner urban shopping street | 66 | 776.688 | 4,3% |
| City centre district (> 50 outlets) | 27 | 540.891 | 3,0% |
| District centre large (25-50 outlets) | 135 | 695.790 | 3,8% |
| District centre small (10-25 outlets) | 482 | 1.363.578 | 7,5% |
| Neighbourhood centre (5-9 outlets) | 448 | 625.408 | 3,5% |
| Mini convenience centre | 177 | 298.599 | 1,6% |
| Other shopping areas: | 166 | 3.471.086 | 19,2% |
| Big Box Retail Park | 148 | 3.361.376 | 18,6% |
| Specialty centre (e.g. FOC's) | 18 | 109.710 | 0,6% |
| Total Dutch retail stock | | 18.117.285 | 100,0% |

2.2.2 Retail planning in other Western European countries

Compared to other European countries the Netherlands has a very intricate retail structure (e.g. Davies, 1995; Guy, 1998a). The share of peripheral locations in total retail space is substantially lower than in other Western European countries. Most other Western European countries have known a long period of liberal retail planning since the 1960s. Especially in countries like France, Belgium and the UK, out-of-town shopping areas have been developed for decades, specifically designed for car-using consumers. According to Fernie (1995), out-of-town retail development came in several different waves. First, due to increased price competition between retailers, new innovative retail concepts appeared. The hypermarket (originated in France) and the self-service stores specialising in particular types of non-food retailing are well-known concepts that became established outside or at the edge of cities. Later, out-of-town retail development became more organised, with the active involvement of the real estate development industry in the 1980s. The retail park concept (an assembly of three or more retail warehouses) became enormously popular with developers in the UK. Several hundred of such centres were built by the early 1990s (Guy, 1998b). Private parties (both developers and retailers) initiated these new retail developments and tried to convince local authorities of the feasibility of their plans. In the UK, for example, these developments gave rise to several factory outlet centres in the 1990s while there was little attention for inner city developments (Fernie, 1995). Most Western European countries recently decided to tighten regulatory measures on out-of-town retail, being aware of the economic impact of out-of-town developments on inner cities. Because of the negative effects of out-of-town retail developments, legislation in these countries was centralized again and out-of-town developments were discouraged (Evers, 2002; Jannette Walen, 2005).

The retail system in Germany is the most comparable with the Netherlands, since they are both restrictive in nature. Like the Netherlands, Germany adapted the theory of central locations as a planning principle for urban growth and, as part of that, the distribution of retail trade. However, Germany has also known a short period of development of new retail types outside the functional hierarchical pattern. Between the mid-1960s and mid-1970s discount stores, self service stores and shopping centres were built even at greenfield sites, in reaction to increased car ownership and to accommodate urban growth (Vielberth, 1995). Since the 1980s, rules were laid

down to restrict such developments in Germany. Special permissions were required for stores larger than 1.500 m² (later 1.200 m²) to be located outside city centres. Regional (state) governments were responsible for the implementation of the guidelines. They were allowed to define additional rules for restrictions on product categories. It took until 1993 before municipalities generally used federal government guidelines and produced regional development plans. The policy vacuum in Germany until 1993 resulted in several peripheral shopping centres, especially in the Eastern part of Germany where due to the reunification a demand for a wider range of products increased (Guy, 1998a). The development of CentrO in Oberhausen (“the largest out-of-town shopping mall and entertainment complex in the European continent”) proved that in spite of a strict planning policy, on a local policy level, decisions may turn out differently. Evers (2004) indicated a relationship between this decentralized planning system in Germany and the scale of unwanted peripheral development. Because of differences in interests, local policy makers may ignore policy guidelines formulated at a higher policy level.

To conclude, compared to other Western European countries the Netherlands has distinct planning policies. While the Dutch government has decided to deregulate and decentralize retail planning policies, other European countries became more restrictive and set new rules at the national policy level. In the UK, for example, the Department of the Environment laid down in a policy document that preference should be given to town centres for new retail development, followed by edge-of-centre locations, and finally out-of-town locations (Guy, 1998a; Evers, 2004). However, despite deregulation by the central government, Dutch retail policies at the regional level are still rather restrictive. In general, new peripheral retail locations have to be developed within the urban envelope, connected to existing infrastructure, without affecting the economic position of inner cities. The question is, however, what effect decentralizing authority to regional and local governments will have on micro-level decision making procedures since interests of involved stakeholders may differ from those on a national policy level. Experiences from Germany (see e.g. Vielberth, 1995; Guy, 1998a; Evers, 2004) showed that in spite of restrictive planning rules in practice new retail plans have been developed in conflict with these rules.

2.2.3 Changed planning philosophies

Decentralization and deregulation of retail planning, and as a result cooperation of stakeholders at a local policy level, is in line with more general shifts in planning views. To be able to keep up with changes in society, planners have been looking for new approaches to urban planning. Where traditional planning approaches were designed to cope with urban expansion in regions and cities conceived as being relatively self-contained, new planning approaches have to recognize urban areas as open, diverse and complex institutional arenas. In such a complex environment, classical planning approaches, resulting in creating or adopting a plan, are no longer sufficient. In the literature, different planning paradigms have been pointed out as answers to the demand for new planning approaches. Alexander (1998) introduced the concept of coordinative planning as an answer to the lack of attention to the implementation phase in classical planning approaches. According to Alexander (1998, p. 304), coordinative planning involves “*organizations interacting to concert their future decisions and actions in pursuit of mutual goals*”. In this process, planners have to identify the agencies, organizations and constituencies participating in the urban network, and define their roles and interactions in the context of developing an agreed implementation strategy. Similarly, the idea of collaborative planning, introduced by Healey (1998), is grounded in the theory of relational webs or networks. Healey (1998, p. 1541) argued that “*collaborative approaches to urban planning may very efficiently contribute to building an institutional capacity focused on enhancing the ability of place-focused stakeholders to improve their power to make a difference to the qualities of their place*”. Collaborative approaches as distinguished from command and control approaches are based on collaboration among stakeholders in policy development as well as delivery.

Also the newest national policy document on spatial planning, the “Nota Ruimte” (VROM, 2004), can be characterized as a shift from restrictive spatial policy dominated by the government towards a form of spatial planning where public-private partnerships predominate. This form of spatial planning is called spatial *development* planning and is designed to address – often inter-municipal – regional development (Priemus, 2007). Following Dammers, Verwest, Stafforst & Verschoor (2004, p. 38), spatial development planning is defined as “*A regionally-oriented policy that responds to anticipated trends and shifts in society, offers a new solution for uniting different land-use needs, supports active input from interested parties, and pays attention*

to actual implementation". The shift to development planning came from the idea that authority with respect to space ought to be redistributed across several administrative levels and between the state and society. At certain places, an effective and creative spatial planning policy can be selectively implemented to support and strengthen desired developments.

The introduction of private parties in spatial planning is also associated with changes in the land-market system. Historically, Dutch municipalities are actively involved in the land market as buyers and sellers of land. They often pursue an "active land policy" as a means to achieve policy goals, alongside traditional land-use planning tools like zoning. This active strategy implies that they buy the land on the market, either with or without the help of "compulsory purchase", service and develop it before it is sold off to housing associations, property developers, individual households or businesses (Needham 1997; Buitelaar, 2010). Since the 1990s, however, this institutionalized land-market system has changed and property developers have become more active. They try to acquire land in an area where they anticipate possible changes, to be fixed in the land-use plan, which could open up opportunities for lucrative developments, such as for example shopping centers (e.g. Priemus & Louw, 2003; Priemus, 2007). Where previously municipalities had nearly everything under their own control, they now find themselves obliged to cooperate with private developers. Thus, not only because of changes specifically in retail planning, but also because of more general changes in spatial planning and the land-market system, a multi-stakeholder approach is required to understand decision making at a local policy level.

2.3 The retail planning problem

In this study, we focus on the retail planning problem in the Dutch context. Much of the debate on retail planning nowadays is concerned with the question whether or not to allow retail developments at peripheral locations. Since the latest policy document on spatial planning ("Nota Ruimte") gives room for the realization of retail facilities outside the traditional hierarchical structure, municipalities are willing to strengthen their own economic position and, as a consequence, consider peripheral retail development as a serious option. Furthermore, the question is which retail categories should be allowed locating outside inner cities. Several Dutch municipalities are in the middle of this discussion. However, the retail system is changing

continuously and it is hard to capture the dynamics of the decision environment. In this section, the most important dynamics in the retail environment are discussed to gain a better understanding of the retail planning problem.

2.3.1 Changes in consumer behaviour

Although consumers are actually not one of the decision makers in the development process of new retail outlets, their choices must not be neglected. A commonly used expression to emphasize the importance of consumer traffic runs: “Consumer vote with their feet”. A shopping area that is not capable of attracting sufficient consumers to be profitable will fail. However, consumer behaviour has changed continuously. In the past, the inner city was the shop location that offered the broadest variety of products. People visited inner cities for different shopping motives. Nowadays, due to increasing car usage, this is no longer obvious. The reduced accessibility of the city centre and a lack of parking facilities weakened the position of the city centre relative to shop locations in the periphery. Possibilities for realising parking space on greenfields are much easier and cheaper than those in existing inner cities. Nevertheless, in the Netherlands, shopping in the city centre is still considered to be quite attractive, especially due to the growing attention for leisure facilities and improved accessibility in recent years.

As a result of increasing car mobility, consumers face a larger set of opportunities when and where to go out for shopping. The choices made will depend on the underlying shopping trip purpose of consumers: shopping for a specific purchase or recreational shopping (or browsing). Two dimensions can be defined, underlying these shopping trip purposes: utilitarian and hedonic shopping (Babin, Darden & Griffin, 1994). Utilitarian values are related to task orientation, while hedonic values reflect personal gratification and self-expression found in the shopping experience itself. In the literature, also other terms are used to describe motives for shopping, such as convenience shopping, comparison shopping, household shopping or personal shopping (e.g. Borchert, 1995; Guy, 1998b; Kooijman, 1999; Bak, 2000; Gorter, Nijkamp & Klamer, 2003). A suitable distinction for the Dutch situation is the set of three definitions described by Evers, Van Hoorn & Van Oort (2005): “run-shopping”, “fun-shopping” and “goal-oriented shopping”. Run-shopping stands for the purchase of frequently needed food and non-food products like groceries, drugs or flowers, also called convenience goods (Guy, 1998b). Availability, convenience and

accessibility are the most important features of shopping areas that serve run-shoppers. This type of shopping is also called convenience shopping. Since large food stores like hypermarkets do not exist in the Dutch retail structure, run shopping is mostly done in neighbourhood centres that offer one (or two) supermarket(s) completed with smaller shops like a bakery, drugstore, textiles and household goods. Fun shopping is associated with visits to several comparable shops (e.g. for the purchase of shoes). This is most likely to take place in city centres in which there is a wide variety of shops and goods, and also many opportunities for entertainment. For fun-shopping the shopping activity itself is more important than direct purchases. Getting the best product for the best price is the most important purpose for goal-oriented purchases, like for example do-it-yourself products. Visits to these types of stores are not often combined with visits to other stores.

The current Dutch retail structure provides opportunities for all three shopping motives: Neighbourhood centres for run-shopping (or convenience shopping), city centres for fun-shopping and peripheral locations for goal-oriented shopping. However, consumer behaviour cannot be imposed. It is known that recently built peripheral locations in the Netherlands are visited for recreational purposes as well, as found by Gorter *et al.* (2003) in their research on the effects of Woonmall Alexandrium in Rotterdam. Although furniture strips were originally focussed on goal-oriented shopping, as a result of redevelopments and enlargements, comparison shopping (e.g. for furniture and home decoration) and recreational shopping became more important in these shopping areas. Since the current planning legislation allows the addition of other product categories to traditional furniture strips, these locations may gradually change in character and compete with the inner city. When visiting a neighbourhood centre, different purposes may play a role. Personal motives, like meeting friends and getting high services, are becoming increasingly important for visiting neighbourhood centres. The neighbourhood centre offers an attractive environment, especially for those being less mobile, like the growing population of elderly. For example, supermarket chain “Albert Heijn” anticipates on this development by offering a coffee corner in the supermarket as a kind of meeting place. To summarize, the rise in car mobility enabled consumers to choose different types of shopping areas at different locations, depending on their prevalent shopping motive. However, different retail locations can also cater to different shopping motives.

Besides the rise in car mobility, other changes in consumer behaviour have affected the shopping landscape. We mention here income growth, decreasing leisure time and the use of the Internet. Income growth has coincided with a less than proportional growth of expenditures on retail goods. In other words, the priorities of consumer demand have shifted to other goods and services such as leisure activities (Jansen-Verbeke, 1991; Boekema, Buursink & Van de Wiel, 1996; Howard, 2007). More than before, retail locations have to compete with other forms of time spending including visiting amusement parks, outdoor sports, visiting a theatre. Conversely, due to the increase in dual earner households, leisure time has decreased. Specifically, this target group may do their groceries while commuting from work to home and visa versa because of efficiency reasons. On the other hand, this target group will look for pleasant shopping environments with a broad variety of shops and restaurants for spending their scarce free time. The use of the Internet for purchasing goods meets the efficiency requirements of a growing part of the population. E-commerce has increased enormously over the last decade. In 1998, only 16% of the Dutch population was connected to the Internet. In 2009, this percentage has increased to 93% (CBS, 2010). Internet purchases increased from 2,42 billion euro in 2005 to 6,38 billion euro in 2009 (Blauw Research, 2010). Although the Internet penetration has almost reached its maximum, it is expected that consumer spending through Internet will further increase (see e.g. Doherty & Ellis-Chadwick, 2010; Liu & Forsythe, 2011). Technological innovations to develop sophisticated, efficient and safe websites for online-purchasing are not exhausted. E-commerce will certainly lead to differences in the retail landscape. Consumers will be better informed by the Internet before they purchase. A recently finished Dutch study found that for 41% of the purchases (in 29 non-food product categories) the Internet was used to obtain information on the product (Blauw Research, 2010). The opposite also occurs, where people use the physical store to get informed about the product features and eventually use the Internet to purchase the product for the lowest price. Although it is not expected that the physical store will disappear due to the increase of e-commerce, its function will change depending on the product categories that are sold. As consumers use different retail locations for different purposes, retailers will set up multi sales channels to reach consumers (see e.g. Weltevreden, 2007; Konuş, Verhoef & Neslin, 2008; Schröder & Zaharia, 2008).

2.3.2 Changing demand retailers

With respect to the changing demand of retail firms, the last decades have seen a trend towards increasing scale of stores and internationalization of businesses (Guy, 1998a; Dawson, 2001b, Myers & Alexander, 2007). Especially the increase in scale of retail stores has a spatial impact. While large stores have been part of the retail landscape for decades in the form of department stores, the search for scale-related benefits of operation has moved into other types of stores as well (Dawson, 2001a). In the European retail landscape large stores selling a huge range of products appeared in a broad area of retailing such as food, home improvement products and electronic goods, (Guy, Bennison & Clarke, 2005). These stores are often located outside the traditional retail structure. Bigger stores offer cost and efficiency gains to retail firms. According to Guy & Bennison (2002) and Guy *et al.* (2005) consumers derive major benefits from bigger store formats since these stores offer greater depth and breadth of product ranges. As a result, bigger stores offer consumer greater choice and the ability to do one-stop-shopping. The enlargement of shop formats resulted in an increase of the average floor space per retail outlet. Since it is difficult to fit these large store format in the traditional shopping areas (inner cities and supporting shopping areas), scale-enlargement is particularly noticeable in other (often peripheral) shopping areas, as shown in Figure 2.1.

Within these large scale retail concepts there is a trend of broadening product categories. Clear boundaries between retail segments have disappeared. Examples of this phenomenon are drugstores selling toys and supermarkets selling computers. In the discussion whether to allow large scale retail formats at peripheral locations the definition of product categories received a lot of attention. Although most provinces defined these categories in their newest regional plans, there is still confusion and discussion about the desired situation. Since retail firms continuously have to adapt their strategies to be profitable in a highly competitive environment, they will search for the boundaries of the definitions of product categories. Therefore, it is questionable whether rules in spatial plans for allowing product categories at particular retail locations make much sense.

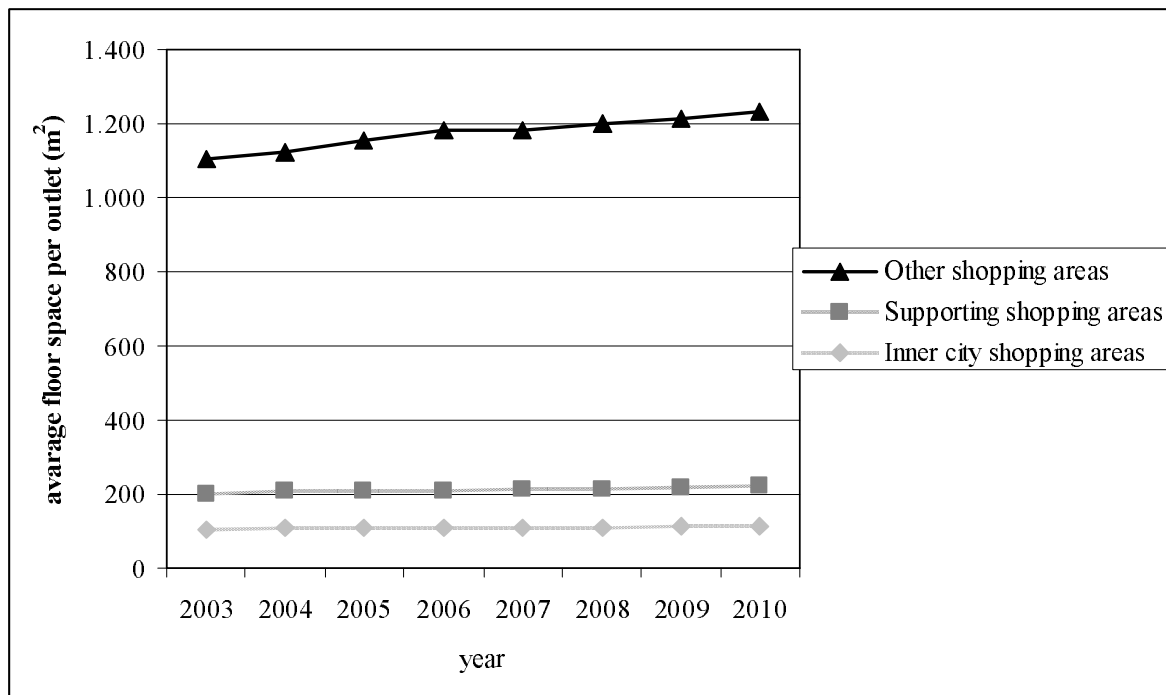


Figure 2.1 Scale-enlargement in the Dutch retail landscape (source Locatus, 2010)

The search for scale-related economies at the level of the organization is even more mesmerizing than at the level of the shop. Retailers continue to pursue the benefits of larger scale development to successfully compete in the highly competitive retail environment. International expansion is a strategy to enlarge scale within the retail firm. According to Guy (2001), there are different ways for retail organizations to enter new countries: (1) by buying (parts of) an existing retail chain or (2) through developing new outlets in the new country. Regardless the strategy, retail firms will face constraints when entering new markets, including: competition regulation, regulation of opening hours, legal restrictions and property market and planning restrictions. In case of loose planning control and easy availability of land, a retail firm is more likely to expand through development of new stores. As Guy argued, property and planning issues are likely to affect both “push” and “pull” aspects of internationalization. Both, the scarcity of land and the traditional strict planning regime, made the Dutch retail market difficult to enter for foreign retail firms. Nevertheless, in Western Europe a core cross-border retail structure has occurred including the Netherlands as part of this structure (Myers & Alexander, 2007). As a result, at present, developers and planners in the Netherlands have to cooperate with professionalized, international retail chains (often representing large store formats) while planning new retail facilities.

2.3.3 Property market circumstances

Property market circumstances have a major influence on the building activity of developers. Since the growing demand for retail space investors found retail properties an interesting investment asset. In their search for attractive investment assets retail properties offer interesting return rates. Figure 2.2 shows the course of return rates since 2002 for the main property segments. Retail property demonstrated the highest return on investment over that period. Also the course of retail returns is the less volatile. However, since the financial crisis, return figures decreased steeply for all property categories. According to Jones Lang LaSalle (2010) the retail sector constituted the main investment category for Dutch institutional investors representing a share of 32% of the domestic direct real estate portfolio. Retail property has, compared to other types of real estate, specific investment characteristics. Shopping centres offer the possibility to invest a large amount of capital in one single estate. However, this lumpy character makes shopping centres inherently risky (DeLisle, 2005). Besides, investing in shopping centres is management intensive and requires specific knowledge of the retail sector. Nevertheless, unlike other sectors, the cash flow from rental income is regarded as very stable in the retail sector. For example, rental income within the office sector displays greater volatility because of greater fluctuation in rent levels and higher vacancy rates (Jones Lang LaSalle, 2010).

The fact that investments in Dutch retail properties can be considered as stable is also caused by the strict planning policy in the Netherlands. A highly regulated property market or one affected by strict planning control is likely to demonstrate scarcity of land for certain types of development. This raises costs and, thus, requires greater levels of sales in order to provide an acceptable return on capital invested (Guy, 2001). On the other hand, due to a strict planning policy, the Dutch retail property market is characterized by artificial scarcity and low vacancy rates. This relationship between planning policies, the vitality of city centres and property market performances has been subject of various studies (e.g. Adams, Disberry, Hutchison & Munjoma, 2002; Jackson & Watkins, 2005; Jackson, 2006). The planning system influences the ability of the development industry to respond to user signals and investor markets. Thus, strict planning policies discourage new investments and protect the current values of properties in existing retail areas. Loosening up planning policies stimulates new investments that raise the level of supply, leading to a new market equilibrium with corresponding rent and return levels.

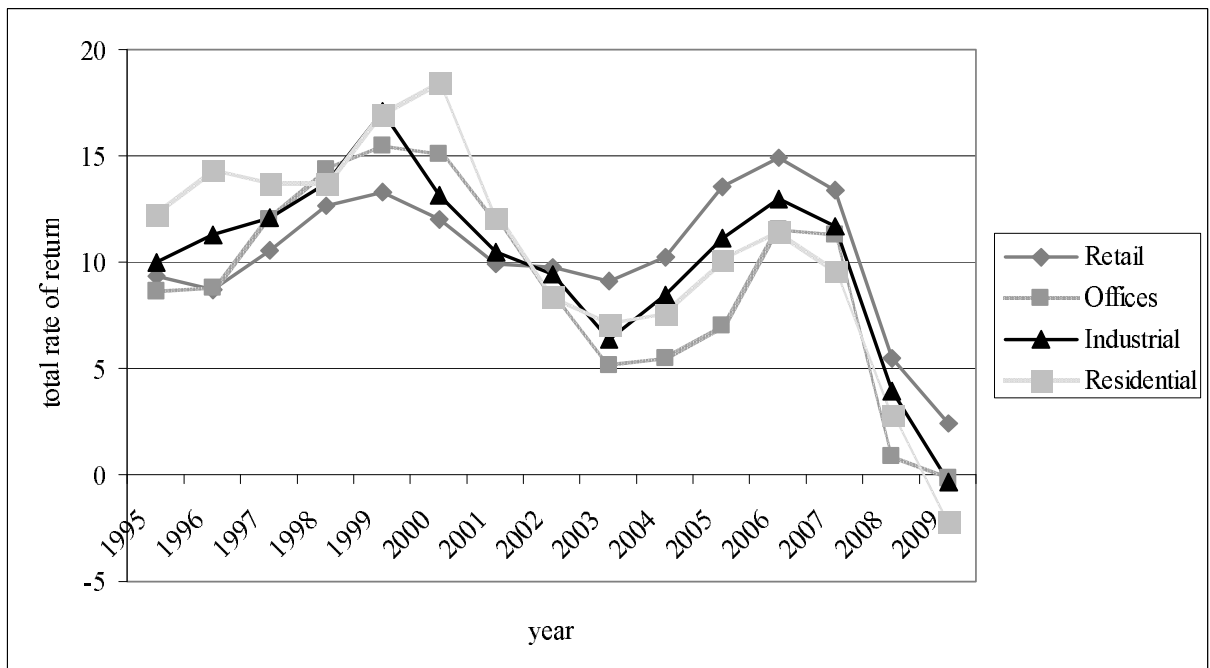


Figure 2.2 Return rates different property categories (IPD Nederland, 2010)

Figure 2.2 also shows the effect of the financial crisis. Since the financial crisis, real estate investors have little investable capital at their disposal. This shrinking demand of investors does affect development activity. The financial crisis is also tangible for the development industry itself since it caused difficulties among developers to get their projects financed. Banks only provide lending for new investments under strict conditions. Due to the financial crisis the retail development market attained an uncommon and unbalanced situation. Although planning policies have changed and should have triggered new developments, at present the development industry is on hold because of the lack of financing. However, even when the market is recovered from the consequences of the financial crisis it is doubtful that new retail real estate should be added to the Dutch retail property market. Compared to other European countries, the Netherlands has one of the most mature retail property markets with 1.6 square meters of retail space per inhabitant (Jones Lang LaSalle, 2009). It can be concluded that the Dutch retail property market is saturated. It is not expected that the demand for retail space will increase in the near future as it did during the last decades. Internet purchasing and changing demographics will lead to stabilized or even decreased consumer spending in physical shops. However, there is still a need for replacement and improvement of the quality of current supply. According to the

Dutch Council of Shopping Centres (NRW Taskforce Dynamische Winkelgebieden, 2010) the new challenge for Dutch retail is to formulate regional plans for restructuring existing retail property stock in order to offer possibilities for the development of new properties meeting nowadays requirements for different locations.

2.4 Different perspectives to retail planning decisions

In this section, different stakeholder views towards retail planning decisions are explained in light of their specific interests. Special attention is given to the discussion on allowing new retail trade at peripheral locations. The interests of the three major stakeholders involved in retail planning – planners, retailers and real estate developers - are discussed. Also the interests of other stakeholders, such as landowners, are discussed briefly.

2.4.1 The planner's perspective

As public servants and as part of their professional commitment, planners are bound to serve the public interest. What is in the public interest, however, is subject to wide and varied forms of interpretation (Evers, 2004). Planners employ two main strategies in retail development: imposing restrictions on unwanted development, and actively encouraging desired development. Every new retail plan brings both wanted and unwanted effects. It is the planners challenge to consider all possible positive and negative externalities before making a land-use decision. Table 2.2 shows the negative and positive impacts of peripheral retail developments from a planner's perspective.

The most obvious aspect is the possible loss of trade in existing stores. While new peripheral retail locations or expanding existing peripheral locations may offer new possibilities for the establishment of large-scale innovative retail concepts, it may also cause a loss of trade in the inner city. Guy (2007) analysed the consequences of several large-scale retail developments in the UK and concluded that in some cases a so-called "spiral of decline" was triggered due to the fact that trade had to be diverted to different locations and the fact that many retailers of the existing centre moved to the new centre. This process is illustrated in Figure 2.3.

Table 2.2 Impacts of new peripheral retail developments: planner's perspective

| Negative impacts | Positive impacts ² |
|--|---|
| <ul style="list-style-type: none"> • Unbalanced retail system. Loss of trade in existing stores city centre • Increased car-mobility • Increasing disparity in access to retail facilities between social groups. (Social exclusion) • Negative environmental externalities (e.g. pollution of landscape) • Space-use conflicts | <ul style="list-style-type: none"> • Come towards demand for innovative new retail concepts • Come towards growing demand for large scale retail developments • Peripheral investments will encourage reinvestment in other shopping areas as well. • Financial benefits through paid taxes and earnings of selling land • Increase of employment • Improve economic position through consumer spending within municipality • Improve attractiveness city for consumers outside the city |

To prevent this process to occur, compensating investments can be done in the existing shopping centres. The most obvious investment is adding floor space to the existing centre as well. However, this is difficult to accomplish if there is not enough consumer demand or simply because there is not enough physical space to enlarge the existing centre. Other forms of compensation can be thought of to reach a well-balanced local retail system. Examples include: funds for city management (for promotion and events that contributes to a better image and attractiveness for a broader catchment area), upgrading public space or improvement of infrastructure and parking space. Related to the compensating investments, Van de Krabben (2009b) introduced a compensatory planning approach for improving efficiency and reducing negative effects of land and property development. The basic idea of this approach is that retail planning regulation obliges the developer of the peripheral retail location to compensate retailers in the town centre for negative trade effects.

² The last three positive impacts only occur when peripheral development is the only alternative for retail expansion within a municipality.

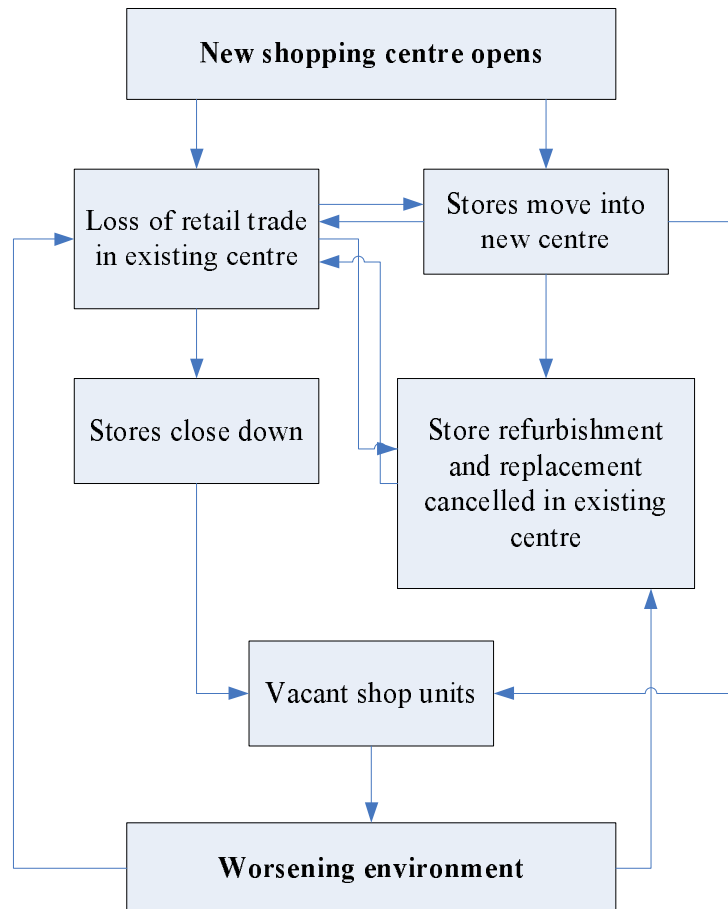


Figure 2.3 Spiral of decline (Guy, 2007)

However, he also stipulated difficulties to implement this approach. First, it is difficult to define the exact size of the negative trade effects that have to be compensated. Another problem concerns the way the compensation process should be organised; who should be compensated and how? Without trying to be precise in the nature of the compensation, compensating investments may contribute to a new balanced retail structure on a local level as shown in Figure 2.4.

Another negative impact of the development of peripheral shop locations is the increase of car use. Decentralised retailing had been accused of encouraging private car travel at the expense of walking, cycling and public transport trips, and of increasing the overall length of shipping trips by car.

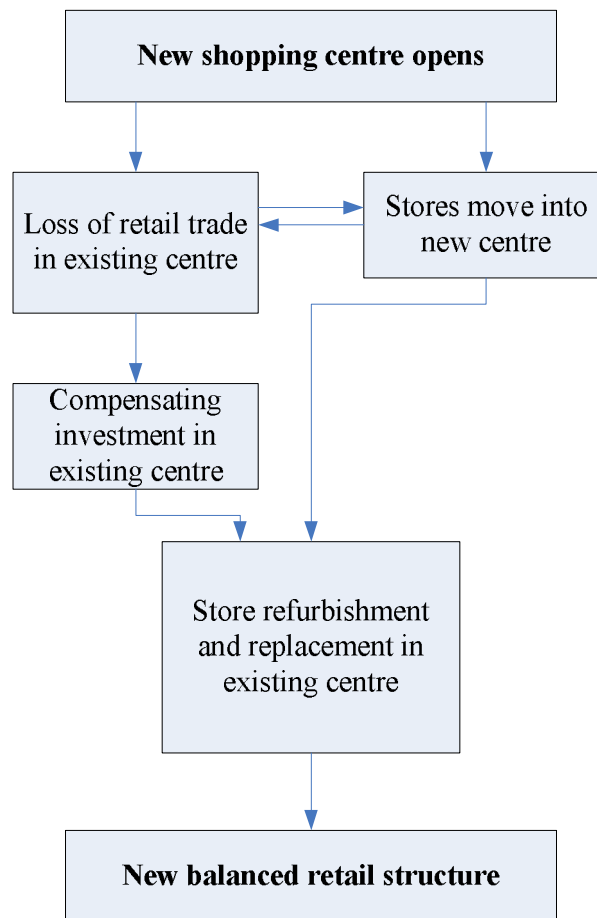


Figure 2.4 Planning based on compensation

The counter argument is that further development of off-centre retailing is desirable because it reduces average trip length (Guy, 1998a) and reduces inner city congestion. Because of the fine-woven urban network that is characteristic of the Netherlands, a good infrastructure for using bikes, and the fact that the existing retail structure offers facilities for all consumers at walking / cycling distance, it can be assumable that peripheral shopping in the Netherlands will encourage car-use and discourage other modes of transport.

Some externalities are less obvious, but important to discuss here. The fact that peripheral retail facilities place particular product categories on locations that are only easy to reach by car, makes these categories inaccessible for certain consumer groups. In the Netherlands, this form of social exclusion in relation with shopping has not been a topic of debate. In the UK, however, social exclusion became a key issue for the Labour government (Guy, 2007, p. 194). Davies & Champion (1980) put apart different disadvantaged consumers who found access to any form of

shopping very difficult, ranging from unemployed households, elderly to physically disabled consumers. A lack of access to food retail, particularly food that is part of a healthy diet, has been studied frequently (e.g. Furey, Strugnell & McIlveen, 2001; Wrigley, 2002; Strugnell, Furey & Farley, 2003). The existence of so-called food deserts is the effect of large grocery retailers locating at peripheral locations. Some studies also show that an increase of the number of stores in an area (including peripheral located shops) does not necessarily mean that they will automatically appear in a consumer's choice set. Kirkup *et al.* (2004) showed that large format superstores were excluded from the choice sets of some elderly consumers because of the effort and physical walking distances involved. Williams & Hubbard (2001) found that deprived consumers tend to use traditional shopping facilities rather than newer stores and shopping centres. These findings suggest the tendency for disadvantaged consumers to use older, traditional retail facilities providing less nutritious products can be interpreted as the result of self-exclusion. However, planners have a responsibility to facilitate all consumer groups. Especially with the growing population of elderly in the Netherlands the accessibility of shopping areas for disadvantaged consumers has to be taken in consideration.

With respect to retail planning decisions, there may be a big difference in interests between the administrative and political responsible entities within a municipality. As Evers (2004, p. 72) argues, one thing that seems to bind all politicians is the desire to be re-elected, and so project a positive image of public activities in which they are involved. Another commonly used political argument to allow peripheral retail development is the fear that if they refuse, the neighbouring municipality will allow the development, and as a result the municipality still has to suffer the consequences. In this study, we regard planners as being public servants working for local governments. In this role, planners are important advisors for local politicians who are ultimately responsible for deciding on controversial land-use issues such as peripheral retail developments.

2.4.2 The developer's perspective

Retail property as a separate investment asset came into being in the 1960s and 1970s. Since then retail property development has bloomed into the most specialized development discipline (Oude Veldhuis, Rompelman & Fokkema, 2000). The first developers active in the Dutch retail market

were derivatives from banks. For example MBO (“Maatschappij voor Bedrijfsobjecten”) was a daughter of the “Nederlandse Middenstandsbank” and developed the first shopping centre in 1967. Real estate development was a tool to give credits to the shopkeepers, the main interests of the bank. Nowadays, the primary interest for a real estate developer is to make profit, or more precisely, to maximize profit potential with a minimum of risk. For real estate developers retail property became interesting because of a growing demand. On the one hand the demand for new retail space was caused by an increase in consumer spending, as previously discussed (section 2.3.1). On the other hand, there was a growing interest from investors searching for new investment opportunities as discussed in section 2.3.3. The risk associated with retail investment is regarded as high because of the required capital and the management intensive character associated with shopping centre investments. However, investments in retail property are stable investments because rent income is rather stable. Depending on the kind of developer, more emphasis may be put on either profit or risk, or on short-term or long-term goals. In the retail development industry, we can distinguish roughly two types of project developers (Hieminga, 2006). The independent project developer with a short-term goal or, more precisely, real estate development is their goal in itself. Through project development activities, continuity of operational management and high returns on investments are pursued for shareholders. According to Evers (2004), their most relevant concerns include market conditions upon completion, interest rates paid on the land and construction costs. The second type of project developers has long-term goals since they keep the real estate in their own portfolio after development. This group considers real estate development as a means to come to good real estate investments. Especially for this group of developers, peripheral retail development may be a threat if they recently invested in the revitalization and enlargement of inner cities.

Because of the strict retail planning policy, initially development opportunities were mainly related to the revitalisation and enlargements of existing shopping centres. Dutch development companies gained a lot of experience in extending shopping areas in inner cities by using existing open spaces. Especially during the 1990s new shopping centres were added to the existing inner cities. Examples include the “Heuvelgalerie” in Eindhoven, the “Barones” in Breda and the “Kalvertoren” in Amsterdam (Oude Veldhuis *et al.*, 2000).

Table 2.3 Impacts of new peripheral retail developments: developer's perspective

| Negative impacts | Positive impacts |
|---|---|
| <ul style="list-style-type: none">• Decrease value standing investments• High risks involved with large scale, stand-alone retail developments | <ul style="list-style-type: none">• New investment opportunities• A high degree of freedom in design and concept development• Relatively cheap land |

The introduction of the Nota Ruimte gave room to the real estate development industry to expand investment opportunities. Peripheral locations are attractive because of lower land prices and a higher degree of freedom in developing / designing a retail concept. According to Van der Krabben (2009a) the effect of the new planning policy is that private developers have developed much more new plans for out-of-town retail developments than in previous years. Often developers cooperate with retail organizations (as being the anchor tenants of the shopping area) in an early stage to develop joint development proposals. Finally, it has to be recognized that retail organizations can also act as real estate developers or investors themselves (e.g. Ahold and IKEA) in order to provide in their own establishments. Table 2.3 summarizes the positive and negative impacts of peripheral retail developments from the perspective of the developer.

2.4.3 The retailer's perspective

Store location is considered a key-factor in achieving the marketing and financial objectives of a firm. The location choice is a powerful instrument for establishing a sustainable advantage over competition. It is part of an integrated marketing strategy which involves decisions on positioning, operations, store size and format, product range, customer services, price policy and so on (Brown, 1992; Levy & Weitz, 1995). Location decisions may be based on profit maximizing behaviour of retailers. Generally spoken, the location that offers the best profit is the most attractive for a retail firm. Most theoretical location choice models are based on this principle of profit maximizing behaviour (see e.g. Van der Heijden, 1986; Oppewal & Timmermans, 1997; Arentze, 1999). However, planning policies and property restrictions have to be taken into account.

Table 2.4 Impacts of new peripheral retail developments: retailer’s perspective

| Negative impacts | Positive impacts |
|---|--|
| <ul style="list-style-type: none"> • Increase of competition for established retailers | <ul style="list-style-type: none"> • Meet location needs for new business activities • Provide large-scale plots |

Retailers willing to expand their firm by adding new establishments or switching locations have to face both planning regulations and local (property) market circumstances that restrict their choices. Present planning rules in the Netherlands create new opportunities for retailers searching for, often large scale, spaces for new business activities.

Already established retailers may be against peripheral developments because of unwanted competition. Specifically small businesses will be in favour of restricting out-of-town development, arguing that less expensive land prices and car accessibility at such locations constitute unfair competition. For the established retailers, the highly regulated system offers a degree of security. Due to the lack of a firm policy by the National Government, large retail firms such as “Maxeda” (formerly known as Vendex KBB) and “Ahold” are now confronted with a dilemma. Although new peripheral shop locations offer benefits, they invested huge capital in inner cities for decades what make these locations hard to leave. Table 2.4 summarizes the impacts of new peripheral retail developments from the perspective of the retailer.

2.4.4 Other stakeholders involved

Besides the stakeholders previously discussed, other stakeholders are involved in retail planning decisions, although not so prominent. Examples include regional governments, financiers, architects, consultants, citizens, media, interest groups, land owners and project managers. To understand the retail planning decision process, insight in the role of each stakeholder is needed. In several textbooks, the interests and goals of stakeholders involved in planning and development are discussed (e.g. Adams, 1994; Wilkinson & Reed, 2008). Evers (2004) made a detailed analysis of the retail development arena in order to explain the institutional factors influencing retail planning decisions. Besides retailers, developers and planners he also distinguished landowners and financiers as being intimately involved in a retail development

project. If landowners cannot be persuaded to sell or participate, this can become a major obstacle to the development. Although the government may have rights to acquire the land under constraint, this is unlikely to be applied in case of retail development. Besides the land, a large amount of capital is needed to fund developments. Unless a developer is itself a subsidiary of a bank or institutional investor, it must convince other parties to lend money. Financiers or investors interested in retail developments are mostly institutional investors and private investor consortiums.

Other actors that should be mentioned here because of their concern with retail planning decisions are regional governments, citizens and media. In the present Dutch situation, regional governments have an important role to coordinate developments at a local governmental level. They may wish to block a particular project because of overwhelming opposition by neighbouring municipalities. Their regional plans are used as a policy instrument to check whether local retail development initiatives should be allowed. Citizens play an important role in organizing social support for new retail developments. Sometimes citizens are organized in interest groups and use media or direct communication with other stakeholders to influence the decision making process. Media play an important role to inform citizens about positive and negative impact of new (peripheral) retail plans. Several newspapers and professional journals reported on this topic in recent years to share viewpoints and experiences. Finally, the Dutch Council of Shopping Centres played an important role in forming an opinion. Through seminars, expert meetings and newsletters this organization encouraged the debate on this topic between public and private stakeholders.

2.5 Conclusion

In this chapter, the history of retail planning in the Netherlands has been explained. It was discussed how retail planning policy has shifted from a restrictive policy to a relaxed policy that allows new retail developments to be located at peripheral locations. It is striking to see that Dutch retail planning has become more relaxed, while other countries in Western Europe are tightening their planning rules to keep their inner cities viable. The responsibility for retail planning decisions has been delegated from the national government to the local government,

with regional governments (provinces) having a steering role and coordinating municipality exceeding effects.

Because of decentralization of responsibility of retail decisions, local governments have to decide on topics they are not always familiar with. In addition, these decisions have to be made in a very dynamic, constantly changing, decision environment. We discussed dynamics in consumer behaviour, the growing importance of shopping as a form of leisure and the increasing use of the Internet. On the supply side, increase of scale and internationalization of retail firms have changed the demand for retail property. Finally, market dynamics had a big influence on investor behaviour. Although the interest from institutional investors in shopping centres as an investment asset grew, the financial crises led to a slowdown of investment and development activities. To come to a well-considered decision all stakeholders have to be aware of this changing environment and have to judge the consequences of particular planning choices.

To conclude, roles in retail planning have shifted from a national level to a local level and from a public perspective to a public-private (or collaborative) perspective. At the local policy level, planners, retailers and developers as main actors meet each other to decide on new retail development proposals. Depending on their goals, each stakeholder may have a different view on how to improve the retail structure of a particular city and what role peripheral retail development could play. The impact of peripheral retail developments from the perspective of each stakeholder were discussed in this chapter. However, because the new planning regime leaves room for negotiation between stakeholders, viewpoints may change. For example, inexperienced local governments may change viewpoints because of new knowledge or persuasion by other decision makers. Also interactions with other stakeholders (such as media, interest groups, etc.) may influence viewpoints. In the next chapter, this decision process is spelled out in more detail. Case-studies are described briefly to get a better understanding of the interactions between public and private parties initiating new retail developments.

CHAPTER 3

DECIDING ON NEW RETAIL PLANS

3.1 Introduction

In the previous chapter, the retail planning problem was discussed in detail. It was explained that the responsibility for retail planning decisions has been delegated to local governments. Except for guidelines formulated by provinces, there are no strict rules enforced by the national government that prohibit peripheral retail developments. As a result, on a local policy level, public and private stakeholders meet each other and negotiate on new retail development proposals that were inconceivable under former regulations. Although the retail property market is saturated in terms of amount of square meters, there is still room for quality improvements. According to the Dutch Council of Shopping Centres (NRW, 2010), new retail developments are still needed to promote a dynamic and attractive retail structure and to satisfy consumer needs.

The policy vacuum that was created between the introduction of the new planning policy and the actual acceptance of the policy document on spatial planning challenged the development industry to introduce new retail concepts. Also for the near future it is expected that due to a lack of clear guidelines from the provinces and the need for innovation of the retail system, there is little room for new retail concepts. Beneath the actual realization of new retail plans lies a complex decision making process. By absence of a strictly regulated retail planning policy, new developments more often will be grounded on negotiations. Moreover, each decision maker has its own perception on how to strengthen a local retail structure depending on his/her goals and interests, what makes negotiations even more complicated.

In this chapter we take a closer look at the process of decision making regarding retail planning by reconstructing the decision making processes of three peripheral retail development

initiatives in section 3.3. In all cases public and private parties were triggered by the deregulation of the retail planning regime. The importance is emphasized of building a joint agreement by public and private parties to ensure that the new retail project has any chance to succeed. The interactions that took place between stakeholders during the initial stage of the development process are discussed. It is explained how, despite the initial agreement between public and private parties, preferences for the location of retail facilities may shift during the decision making process, due to interactions between stakeholders. To understand the course of decision making during the case studies, insight in formal planning procedures, legal instruments and the retail development process is needed. These topics are first explained in section 3.2.

3.2 The retail planning process

It is difficult to give one clear definition of the retail planning process. To understand how spatial plans are made and actually realized we need to get insight into the legal system, political decision procedures and the realization process of plans from a development perspective. In a blueprint model of planning, a spatial plan embodies a comprehensive model of urban development strategy, providing instructions for public-sector investment programs and guidelines for the private-sector developer (Healey, Purdue & Ennis, 1995). Following this way of reasoning, the planning process can be defined as the way policies, acts, procedures and instruments that facilitate or resist particular spatial developments, are determined. Another way to define a spatial planning process is from the perspective of a single plan proposal. The procedures that have to be followed to get a particular retail plan proposal approved can also be defined as the retail planning process. However, with the introduction of the national memorandum on spatial planning (Nota Ruimte) and the newest Planning Act (Wro), policies are deregulated and responsibilities are decentralized. Planning has gradually shifted from blueprint planning to a form of planning (or development) where negotiation between public and private entities is an important determinant. Nonetheless, procedures have to be followed to get permission for a retail development plan. Section 3.2.1 first gives an outline of how in the current situation policy documents and legal instruments are used to establish views on retail planning for a particular geographical area. In section 3.2.2 the realization of retail plan initiatives is highlighted from the perspective of a developer.

3.2.1 Policy documents and legal instruments

Since the introduction of the newest memorandum on spatial planning (VROM, 2004) and the newest Planning Act in 2008 the principles for retail planning procedures are redefined. In this new Planning Act, the findings from the national memorandum are fixed in rules, regulations and legal instruments. According to Janssen-Jansen & Woltjer (2010), plans are now strategic documents which serve as guides to project decisions, and they are carried out by local and regional players in strategic alliances, with less national government control. The new Planning Act makes a clear distinction between *policy*, *norms* and *realization*. Spatial *policies* for particular areas have to be established in structure plans. On all three policy levels (national, regional and local) structure plans have to be developed. There are no special requirements for the content of such a structure plan. Structure plans (either developed by national, provincial or municipal government) are only legally binding for the government level that developed it itself. Once a structure plan is developed, it is the foundation for spatial policy. The number of structure plans may differ by province or municipality (Voogd & Woltjer, 2009). At the moment, provinces are in the middle of revising their structure plans. When these structure plans do not anticipate reinforcement or expansion of the existing retail structure, the introduction of new retail formats will be difficult in the near future.

The legally binding *norms* flowing from the structure plans have to be fixed in (usually municipal) zoning plans. The zoning plan is the key instrument for spatial planning. Zoning plans have to be determined by the local government for the whole surface of the municipality and are legally binding. A zoning plan sets out the land uses that can and cannot be permitted. In effect, a zoning plan is a passive instrument: it leaves existing land uses untouched and only prevents undesirable land use functions in proposed land use changes (Priemus & Louw, 2003). Under the 2008 Planning Act, provincial authorities have lost their approval authority, and instead are required to give guidelines for zoning plans beforehand (Janssen-Jansen & Woltjer, 2010). Only when particular projects (for example, infrastructural projects) have a national or regional interest, the national government or province can draw their own zoning plan. It is unlikely that this type of legally binding plans will be developed in order to enforce particular retail developments.

To be able to *realize* particular retail development initiatives, these have to fit both the (provincial and municipal) structure plan and the zoning plan. Sometimes plans for new retail locations are reason to change the structure plan and the zoning plan. Especially in situations where the economic position of (parts of) a region has to be enforced, room for new retail facilities may be part of a new provincial structure plan. New retail developments also require change of the zoning plan. Generally, a zoning plan does not provide space for the development of new peripheral retail locations on forehand. In spite of the legally character of zoning plans, it is possible for private parties to request for an adjustment of the existing zoning plan. Within the 2008 Planning Act, the procedures for plan adjustments are laid down precisely. A request for changes in the zoning plan has to be accompanied by a strong motivation. If a private party wants its development proposal to fit a zoning plan, all impacts will be considered carefully by the authorities before starting a procedure to change the zoning plan. Complex political decision processes as well as public inquire procedures make it difficult to get these plans approved.

3.2.2 Plan realization: the retail development initiative

In the previous section, we discussed the formal planning procedure. In practice, new development plans initiated by private parties may be the reason to adjust planning documents, especially under present circumstances, where due to the new Planning Act structure plans at regional and local policy levels have to be developed or revised. Vice versa, a new vision laid down in a planning document may be reason for authorities to invite private parties to develop new ideas for a particular area. Following Nozeman & Fokkema (2008), there are four different occasions for new retail development initiatives:

- A retail organization is looking for possibilities for new establishments.
- A local government holds a competition for the development of a particular area, often based on a preliminary set of requirements.
- A developer or investor believes that based on market research the existing retail stock can be expanded.
- A developer, specialized in bringing new retail concepts on the market, is searching for suitable locations.

In practice often a combination of these occasions occurs. Besides developers, investors and local governments, also architects, urban planners or other private entities may act as initiators of new retail plans. The initiative from one party can be adopted by another party. Often cooperation between parties is needed to get the plan funded and to share risks and expertise.

During the initial stage of the development process, one or several parties decide to study a particular location for development. The initial stage consists of a number of activities that are carried out in different order, depending on the situation. Most important distinction to be made here is the situation where a concept is known but a location is missing, and the opposite situation, where authorities are looking for a concept for a given location. Examples of the first situation are the Factory Outlet Center, and the MobiMall, the idea of developing a fully enclosed shopping mall only focussing on automotive. The second situation occurs mostly when a green or brownfield will be (re)developed in a mixed-use area and retail can take a substantial part of it. Concept development is one of the main activities of a developer. In the case of a retail plan, it contains thoughts about size, tenant mix, positioning, design (enclosed or not), routing, additional leisure facilities, parking, etc.

Other activities covering the initial stage of the development process are a feasibility study, market research, location research, approaching land owners and possible tenants or buyers (retail organizations), etc. For developers wishing their concepts to be realized, getting social and political support for their plans is a key issue in the initial stage. Especially with respect to peripheral retail developments, there may be discord about possible effects of new developments on the existing retail structure. Public parties have to be convinced to get the structure plan and zoning plan tuned to the developer's plan proposal.

Generally spoken, the initial stage will be concluded with an intention agreement if parties agree upon the first feasibility study. The intention agreement gives the initiators of the plan security before entering the next stage of the development process. With the intention agreement, parties decide to cooperate for a certain period exclusively, share information and carry out further research concerning the feasibility of the plan. Many initiatives, however, end in a breakdown when it turns out not to be feasible and/or political support is lacking. Figure 3.3 shows how plans for new retail supply flow through the different stages of the development process from 2007 till 2009. Only a small part of the retail plans actually were realized.

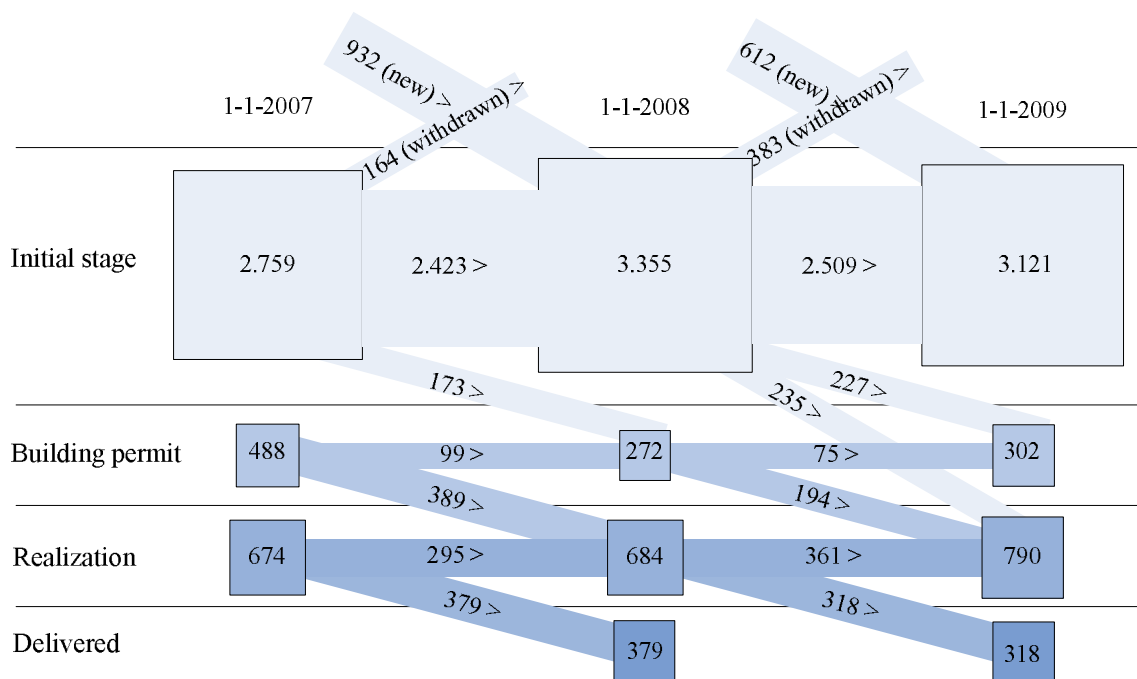


Figure 3.1 Retail development plans flowing through development stages (x 1.000 m² GLA) (source NEPROM, 2009)

The parties involved in the intention agreement are, besides the developer, the landowner and usually the future owner (real estate investor) of the plan. Often, the municipality is the owner of the land. In that case, the municipality is not only needed for the adjustments of the plan, but also as a trader in land. This may even lead to a conflict of interest, since land development is an important source of income for municipalities. In the present situation it more often occurs that developers acquire and develop land themselves (Priemus & Louw, 2003; Priemus, 2007; Van der Krabben, 2009b). However, when the function of the land is not clearly set in planning documents, acquiring land by private parties for peripheral retail purposes is risky.

3.3 Case studies

In this section, the decision making process of three retail plan initiatives are reconstructed based on case study materials. The purpose of these case studies is threefold; (i) to show how relaxing regulations stimulates developers to initiate new peripheral retail concepts, (ii) to show that public and private parties have to build a joint agreement during the initial stage of the

development process before political decision procedures actually start and (iii) to show how preferences of stakeholders regarding retail plan options are influenced during the decision making process. All three cases are initiatives resulting from a relaxation of retail planning regulations at issue. Only one of the cases, Plein Westermaat in Hengelo, was actually realized. The other two initiatives, NL-C Geldermalsen and Tilburg Mall, were different from the first case in terms of size and concept. These large scale shopping mall initiatives eventually never have been realized. The descriptions of the development processes are based on earlier studies by De Jong (2008) and Janssen (2009).

3.3.1 Plein Westermaat te Hengelo

Plein Westermaat is a large scale retail concentration, located in the North of the city of Hengelo, close to the German border, alongside the highway A1. Figure 3.4 shows a picture of this retail location. It is built according to the retail park concept familiar in the USA and consists of 50.000 square meters of retail and leisure functions. The anchor stores are IKEA, Mediamarkt and Toys 'r' Us.

The development of Plein Westermaat is an outgrowth of the master plan that was developed in 1997 for the larger area "De Ronde". The purpose of this master plan was to enforce the economic structure of the Twente-region and encloses, besides retail, also other facilities such as a business park. Master plan "De Ronde" was jointly developed by the municipality of Hengelo, real estate developer TCN and designer West 8. The development of a retail park that fitted in the then prevailing GDV-policy was part of the master plan. The municipality responded to the idea of developing a retail park by starting the procedure to revise the regional retail plan. Market research was carried out to find out whether peripheral retail developments at this location would lead to undesired effects for the existing retail structure. Eventually, the proposal for the development of Plein Westermaat was established in a revised structure plan. Also the zoning plan was adjusted to fit peripheral retail development. The basic assumption in the structure plan was that new peripheral retail functions were allowed but may not lead to a decline of the competitive position of the inner city. Since at the same time IKEA was looking for a suitable location to expand its business, the retail concept of Plein Westermaat was effectuated quickly. All ingredients for making a mutual agreed retail plan were present in this case; a local

and regional government willing to enforce the retail position of that particular region, a developer looking for investment opportunities and a retail firm looking for a new location. In spite of this, during the continuation of the development process there was disagreement among stakeholders about the retail categories that should be located in Plein Westermaat

The total plan consisted of three phases; two of them were actually realized. The development of the first phase, the outlet for IKEA, was realized in 2000. The total area was developed and architect-designed in joint cooperation of the municipality of Hengelo, TCN (developer), IKEA (anchor) and Mecanoo (architect). IKEA owns its own outlet while the outlets from the second phase are rented out by TCN. Existing retailers opposed to the development of the second phase since they realized the possible success of the centre now that IKEA opened its doors. To calm the feelings of the inner city retailers, TCN promised first to postpone the date of opening of the second phase to give existing retailers extra time to enforce their own position. Thereafter, TCN promised to compensate existing retailers with additional investments in the inner city.



Figure 3.2 Picture Plein Westermaat

During the second phase, much attention was paid to the constellation of tenants to prevent undesired competition with the inner city. Eventually, sports, home-decoration and electronics were the main retail categories besides IKEA. That the tenant mix was a crucial topic in the development of Plein Westermaat, was proven by the establishment of the Praxis formula. Praxis is a well-known retail formula in the Netherlands for do-it-yourself products. Since the municipality of Hengelo decided not to allow do-it-yourself in Plein Westermaat, the establishment of a Praxis outlet was hard to defend by TCN. However, Praxis would open a large scale home-decoration store with hardly any do-it-yourself products. This new retail format convinced other stakeholders to withdraw all objections. TCN now could start with the realization of the second phase. This example shows having mutual agreed upon the initial plan proposal, the division of retail categories within the retail plan proposal is still subject for negotiations. These negotiations become even more complicated when retail formulas do not fit one particular retail category and the boundaries between retail categories have become vague. Here, the Praxis formula had to be adjusted to a home-decoration retail format in stead of (the usual) do-it-your-self formula in order to reach agreement between developer, retail firm and municipality. It is doubtful, however, whether these agreements are also legally binding in the future when real estate may be sold to new investors and Praxis' retail strategy may change because of changing consumer behaviour.

Phase three contains an additional 21.000 square meter of retail space and has to complete the plan. However, due to the changing economic circumstances this phase still has not been realized. In the current retail policy of the city of Hengelo (developed for the period 2006-2016) the possibility for expansion of Plein Westermaat with a third phase is still included.

3.3.2 NL-C Geldermalsen

NL-C (“Nederlands Leisure Centrum”) is the name for a large scale retail and leisure project initiated by MAB Development (in short MAB) in 2002 that never has been realized. It was the first initiative in the Netherlands that aspired to integrate large-scale retail and leisure functions in an enclosed shopping mall, situated at an out-of-town location. The plan consisted of in total 130.000 square meters, 100.000 of which were reserved for retail functions. The concept and scale were comparable with similar developments in Northwest Europe (Bluewater in London:

150.000 m² retail and CentrO in Oberhausen: 70.000 m² retail). NL-C aimed to attract 8 to 11,5 million visitors each year. The location in view was a site near by an important junction of highways in the centre of the Netherlands within the municipality of Geldermalsen.

After MAB decided that this concept would be feasible, it got into contact with representatives of the municipality of Geldermalsen. By mutual agreement, actors determined that the site located by junction “Deil” was the best possible location for this concept. In the next step, a more detailed plan was presented to the mayor and aldermen. After the plan was discussed by the City Council, the municipality decided to take this initiative seriously. They commissioned several consultants to advice on the possible effects of the proposed plan. Ordered by the City Council, a feedback group was set up including the mayor, the alderman obligated with planning policies, the chamber of commerce, retail trade organizations and other stakeholders. The task of this feedback group was to formulate an objective view on the reports delivered by the consultants and to inform the municipality about the possible effects. Here, it is shown that although MAB and the municipality mutual agreed upon the initial plan, additional information about possible externalities of the retail plan influenced preferences of members of the City Council. Based on this information, the City Council agreed to accept the proposal to develop NL-C with a bare majority

In the next decision round, additional stakeholders entered the decision arena. First, the Province of Gelderland had to approve the plan proposal. It was already known that the existing structure plan did not allow new developments with the size of NL-C. But since the national planning policy had changed, the Province of Gelderland started a procedure to actualize the structure plan. The municipality of Geldermalsen proposed the province to reserve room in the new structure plan for the development of NL-C. In the meanwhile, neighbouring cities commissioned consultants as well to get a second opinion about the possible effects. Their conclusions were negative for NL-C. Also a strong lobby against the realization of NL-C from interest groups such as retail trade organizations and environmental work groups occurred. This lobby combined with the disagreement among local authorities forced the Province of Gelderland to vote against the realization of NL-C and make no room for this development in the new structure plan.

3.3.3 Tilburg Mall

Tilburg Mall was initiated by OVG Development and McMahon Development Group Europe BV (in short OVG/MDG) in the spring of 2007. The plan concerned the development of a large enclosed shopping mall (between 80.000 and 100.000 square meters retail) at an peripheral location. Like NL-C, retail and leisure functions were combined in the plan proposal. Tilburg Mall had to be located on a site, in the North of the city of Tilburg, in the past used for military purposes. The site is located close to the exit of a highway. Because of the situation close to important other leisure functions including amusement park “Efteling”, animal park “Beekse Bergen” and national park “Drunense Duinen”, adding a mega mall would contribute to the leisure-image of the region. Moreover, the developer intended to realize a sustainable shopping centre, according to the cradle-to-cradle philosophy. The expected amount of visitors each year was between 5,2 and 7,8 million.

The decision making process started in 2007 when the developer and the local government signed an agreement to jointly research the possibilities for the realization of Tilburg Mall. Appointments were laid down concerning basic assumptions, location, diversion of tasks and how this research stage should evolve. The research stage should result in a go/no go decision, a definite choice for a location and an agreement for cooperation between local government and developer. Both actors jointly commissioned consultants to advice on a range of possible effects of Tilburg Mall and the selection of the location. Initially several locations (in and out-of-town) were part of a feasibility study. Eventually a location near to the city border was chosen. To pursuit maximum transparency and objectivity of the decision making, the local government and the development equally shared the costs of the research. From the beginning the developer and municipality cooperated to get to a mutual supported retail plan proposal.

From then, other stakeholder got involved in the decision making process. Neighbouring cities commissioned an advisor as well to get a second opinion about the effects of the mall to their own economic position. In June 2008, all reports were presented to the City Council. A decision was not taken yet. The following months were used to hear viewpoints from different interest groups. In October 2008, the City Council decided to research the feasibility of the plan in more detail according to fourteen predefined conditions. When the results of this feasibility study would be positive, a referendum among citizens should lead to the final decision. In March

2009, the results of the feasibility study led to a positive advice of the Municipal Executive. During the referendum (4th of June, 2009) a small majority (53%) of the citizens of Tilburg voted against the mall. Since the City Council promised earlier to reconcile to the result of the referendum, all procedures concerning Tilburg Mall were quit short after the referendum.

3.3.4 Reflection

All three case studies showed how the relaxation of retail planning policies led to the initiative of new retail developments. Plein Westermaat anticipated the GDV-policy while NL-C and Tilburg Mall were clear examples of initiatives taken during the policy vacuum. For the latter two examples, the concept of a stand-alone peripheral shopping mall (combined with leisure functions) initiated by the developer was the starting point. In the case of Plein Westermaat, it was a conjuncture of a need for reinforcement of the economic position of the region, a developer (TCN) willing to develop new retail concepts and a retailer (IKEA) looking for possibilities for expansion, leading to the initiative of the development of a retail park.

For all three case studies the importance of mutual agreement between public and private parties at the start of the initial stage of the development process was demonstrated. With respect to NL-C and Tilburg Mall there was agreement between two stakeholder groups; representatives of the local government and the developer. Regarding Plein Westermaat the existence of a third stakeholder, retail firm IKEA, reduced the risks involved with the whole development and accelerated the planning process.

All three case studies confirmed that to bring the development initiative further, a broader political support is necessary. Especially within the local governments of Geldermalsen and Tilburg at first there was disagreement about the added value of a peripheral shopping mall within their city boundaries. In spite of this, both governments accepted the proposals, although with a small majority, but left the final decision to the province (NL-C) or the citizens (Tilburg Mall). During the political decision making process other stakeholders tried to influence public and political opinion regarding the peripheral shopping mall. Neighbouring municipalities, provinces, interest groups and associations of shopkeepers all formed their own opinion based on an examination into the (municipality-exceeding) effects of these large scale retail plans. These stakeholders all shared their viewpoints by lobbying and the use of different media, trying to

convince other stakeholder groups to vote against the development of peripheral retail plans. Especially, with respect to Tilburg Mall the role of the media was important trying to influence public opinion.

Only in the case of Plein Westermaat the retail categories were subject to negotiations between public and private stakeholders. For the other two cases the decision making process was stopped before this discussion could even be started.

3.4 Conclusions

This chapter shed light on retail planning decisions from both the planner's and developer's perspective. Local and regional governments are responsible for making structure plans with retail being part of it. Due to the introduction of the new national memorandum on spatial planning and the new Planning Act governments are encouraged to revise their structure plans. In the meantime, several new peripheral retail developments were initiated anticipating deregulation. Three of these initiatives were discussed in this chapter.

The case studies showed the importance of agreement about the ideal retail structure for a particular area to get a new peripheral retail plan initiative approved. Missing consensus will certainly lead to frustration of the development process. Right from the start of the development process, the private stakeholder and the responsible person within the municipality have to agree upon the initial plan. To get to this initial agreement, stakeholders (may have to) adjust their preferences and make concessions, although the case studies did not highlighted this aspect of the decision making process. Once private and public stakeholders jointly agree on the initial plan, the political decision making process that follows may still frustrate plan development. The analysis of the case studies demonstrated that, despite of an initial agreement, further on the development process different viewpoints of other stakeholder groups (such as neighbouring municipalities, provinces or citizens) may affect political decision making. The viewpoints of these stakeholders may be influenced by, for example, new information about possible effects of peripheral retail developments, public debates or lobbying. In the next chapter, the concept of multi-actor decision making will be explained. Here we try to give a theoretical understanding of how and why preferences of stakeholders may be influenced.

CHAPTER 4

MULTI-ACTOR DECISION MAKING

AND ADAPTIVE BEHAVIOR

4.1 Introduction

As concluded in the previous chapters, due to the shift to development planning, retail location decisions are now made in the larger context of stakeholder interactions. Specially the decision where to locate new retail facilities (at a peripheral location or not) or which existing retail facilities to expand is a delicate problem in the Netherlands at the local policy level. The main stakeholders involved in this decision are representatives of the local government, retail organizations and real estate developers. Each stakeholder may have different views or preferences as to the best way of expanding retail supply in a particular city. These views or preferences will likely reflect their professional position in the joint development process. Traditionally, the role of planners is to safeguard a balanced development of the retail structure of the city at large and assure that, ideally, future development is consistent with general societal goals, planning standards and norms such as reducing mobility growth and avoiding environmental impact. Preferences of retailers will likely vary considerably, simply because different actors may be involved. Small retailers tend to be reluctant to allow new development unless they expect synergy effects. Other retailers may be looking for suitable locations to establish or expand (new) retail formulas. Developers will be primarily interested in the development potential of new sites.

In spite of these different views, to get to a plan initiative the three major stakeholders involved have to reach a joint decision. The decision outcome will be affected by the interactions between these stakeholders and the influence of each stakeholder on the preferences of others.

The aim of this study therefore is first to get insight into these preferences of stakeholders involved in retail planning. Furthermore, since planning decisions are group decisions, influence structures between stakeholders while forming preferences have to be revealed. Compared to other group decisions (e.g. household decisions) retail planning decisions are very complex in nature. The decision procedure is time-consuming, stakeholders with different interests are involved and the decision context is often difficult to understand. In order to provide an accurate description of the preferences of the decision makers and their influence structures, it is necessary to understand the concept of multi-actor decision making before developing a research approach.

This chapter starts with a theoretical explanation of the concept of multi-actor decision making (section 4.2). Section 4.3 elaborates the influence structures within group decisions. The purpose of this section is to gain understanding in how and why decision makers interact and how these interactions explain influence structures. Specifically, adaptive behaviour is defined since this is the main focus of this study. In section 4.4 different approaches to model group decisions and their capability in measuring adaptive behaviour are discussed. The chapter ends with a conclusion.

4.2 Multi-actor decision making theory

Multi-actor decision making theories seek to make influence structures within group decisions transparent. Retail planning decisions can be considered as group decisions. Because of the interactions between the group members, adopting a group decision-making perspective involves more complexity than an individual perspective. In the literature (e.g. Raiffa, 2002) two different perspectives to analyze multi-actor decisions are distinguished: cooperative versus non-cooperative. In this section, these perspectives will be clarified in order to define the retail planning decision. Depending on this viewpoint, different approaches can be adopted to investigate multi-actor decisions. Furthermore, in this section, a framework is defined that explains the concept of group decisions.

4.2.1 Cooperative versus non-cooperative decisions

Theories on decision making can be split into individual and plural (multi-actor) perspectives (see Figure 4.1). Following Raiffa (2002), plural decision making can be further divided into two approaches: interactive decision making and joint decision making. Interactive decision making is also called the theory of non-cooperative games. The essence of this theory involves a set of individual decision makers (players, in the language of game theory), each constrained to adopt a choice (strategy) from a specified set of choices, and the payoff to each player depends on the totality of choices made by all players. Each player must choose, sometimes not knowing the choice of others. Each must think about what the others might do and realize that the others are, in turn, thinking about what the rest is thinking. The essence of this perspective is that although the individual decision entities make their choices separately of each other, the payoffs they receive are a function of all the players' choices.

Whereas games involve multiple individuals making separate decisions that interact, joint decisions involve multiple individuals showing cooperative behaviour. Joint decision making is also indicated as cooperative decision making or negotiation. In contrast to game theory, which assumes the presence of fully rational negotiators, negotiation theory seeks to understand how negotiators actually make decisions (Thompson, 2006). In theory, the essentials of games and negotiations differ (see Table 4.1). However in reality, the differences between games and negotiations are vague. Underlying every negotiation structure is a game-like component. If we try to understand public and private parties deciding on new retail developments within a municipality we also distinguish characteristics from both games and negotiations.

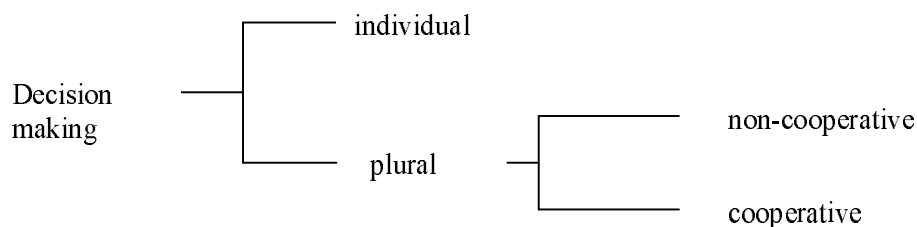


Figure 4.1 Perspectives on decision making

Not in all circumstances both parties will reach a joint agreement. Because of the differences in interests, real estate developers and municipalities can be non-cooperative which may result in a conflict situation. As in games, developers can choose for an option in their own interest, which need not to be the preferred option of the municipality. These individual choices may even result in a breakdown. The negotiation perspective delivers a more realistic view on retail planning decisions. If parties really are willing to reach an agreement they have to negotiate on topics such as the exact location, scale, tenant mix, land prize, etc. This often results in many consultation rounds in which stakeholders substantiate their viewpoints. Even creativity plays an important role, for example in defining the concessions to be made by all parties to be able to end up with a mutual agreed retail plan.

Table 4.1 Essentials games and negotiations (based on Raiffa, 2002)

| Essentials of games | Essentials of negotiations |
|---|---|
| <ul style="list-style-type: none"> - Each decision maker has to act (doing nothing is an act as well). - Decision makers' payoff depends both on what (s)he does and on what the other player(s) do(es). - The decision maker does not know what the other player(s) will do – but (s)he does know what the other player(s) <i>could</i> do. - The other player(s) do(es) not know what the decision maker will do. | <ul style="list-style-type: none"> - Decision makers make mutually agreed-upon joint decisions. - Payoffs depend either on the consequences of the joint decisions or on each decision makers go-it-alone alternatives. - Decision makers can communicate with each other – about what they want, what they have, what they will do if they don't agree, etc. This communication might be honest, or not. - Decision makers can be creative in the decisions they make. |

In this study, we regard public and private parties as unitary decision entities within a group decision. The assumption of a unitary perspective does not preclude the existence of numerous individuals within each decision entity. In reality, parties such as e.g. representatives of a local government have to come to a shared viewpoint on retail planning itself by making a joint decision before starting to negotiate with other stakeholders. Within municipalities, this is even more complex because of the administrative and local political decision making procedures as shown in the previous chapter. Although being aware of this complexity, in this study we assumed local governments to be unitary decision entities due to practical reasons.

4.2.2 Group decisions: a framework

Viewing retail planning decisions from a group decision-making perspective, the interactions and dynamics between multiple stakeholders (acting as decision makers) will be highlighted. The influence of each decision maker on the outcome of the group decision is not equal. An analysis of influence structures gives insight into the degree in which individual group members influence the outcome of a group decision. Revealing influence structures explains the negotiation power of each decision entity. The larger the influence of a decision entity on the final group outcome, the more powerful this decision entity is. Many studies on group decisions are primarily interested in the relative influence of each group member on the final decision result (e.g. Timmermans, Borgers, Van Dijk & Oppewal, 1992; Molin, Oppewal & Timmermans, 2000; Dosman & Adamowicz, 2006). The greater one's level of control on the final group outcome, the more power one possesses. This concept is illustrated by the thickness of the striped arrows in Figure 4.2. Each decision entity (X, Y and Z) has its own preference structure. All three decision entities influence the joint decision; however their influence is not equal. The more the joint decision deviates from the original individual preference structure, the less power the decision entity had during the negotiation.

Knowing the relative influence of each group member does not explain how someone's preference structure actually has been realized. Decision makers extract information from observations of the actions chosen and outcomes experienced from other decision makers. These interactions play a major role in the formation of decision maker's preferences. In Figure 4.2, these interactions are illustrated by the bold arrows between the decision entities. During these

interactions power may be exerted, although not visible and for that reason hard to capture in experimental data. In this study, we focus on these interactions between decision makers and their influence on individual preference formation. We try to understand how preferences for particular retail plan alternatives depend on the preferences of other stakeholders within the decision making process. It is not our purpose to find the best retail plan where all stakeholders mutually agree upon. Although this would be interesting, these negotiation processes are too complex to imitate in a laboratory setting and to analyze in an abstract manner. Our main motivation is to reveal behavioural aspects influencing decision making. To what extent does the preference structure of a decision maker depend on the preferences of others? To some extent, this study must show that, on a local policy level retail planning decisions are the result of a negotiation process where mutual influence, communication and persuading, play an important role.

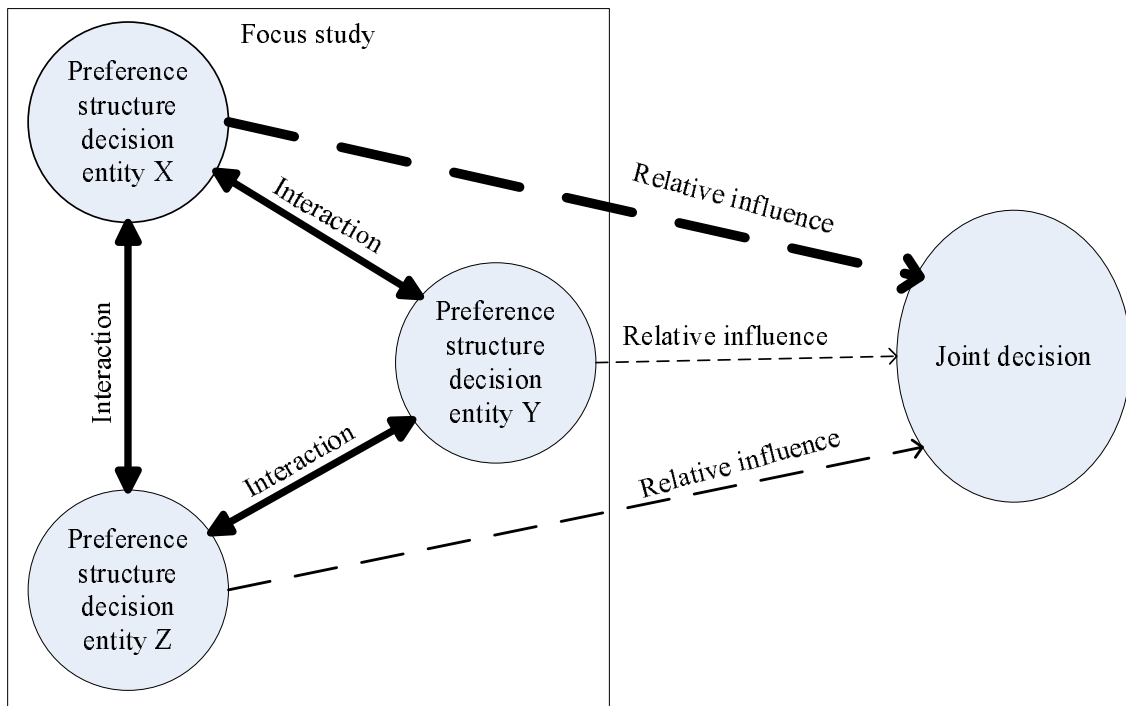


Figure 4.2 Influence structures and preference formation

4.3 Understanding influence structures

The recognition that one or more decision makers may influence the formation of preferences of another decision maker, in a direct or indirect way, and hence choices made, is sufficient reason to establish the nature of the interactive influence. The interest in interactions between decision makers is gaining momentum in a range of disciplines, particularly in economics and sociology. Manski (2000) compared these two perspectives and concluded that the empirical literature within the field of economics has been broadened by research on social interaction but still is in its infancy. Empirical analyses commonly fail to define the concepts of interaction with any precision, and often explain only obliquely how the reported findings shed light on the interactions being studied. According to Manski, they only seek to determine whether statistical associations among the experiences of different persons indicate the presence of some loosely specified form of interaction amongst them. Although empirical studies and modelling techniques already improved since Manski's argumentation (see e.g. Hensher & Puckett, 2007; Timmermans & Zhang, 2009) there is still a need for empirical analysis of social interactions in order to know what classes of social interactions are prevalent in the real world. Before proposing a research approach for empirically analysing interactions between decision makers involved in retail planning, this section provides a conceptualization of interactions. It gives answers to questions such as: How do decision makers interact and why?

4.3.1 Classification of interactions

Interactions can be made in different ways and with different types of entities. The most common way to describe interactions in a negotiation context is that during a particular negotiation round at a particular moment decision makers with different viewpoints exchange information in order to influence each other and eventually to reach consensus. In the literature on social interactions, a more general class of interactions is defined as those interactions that permit preferences of one decision maker to affect the preferences of another decision maker in ways that are not mediated through actions. As Manski (2000, p.121) says: "*It is one thing to say that my preferences depend on your actions and another to say that my preferences depend on your preferences*". Thus, preferences can also be influenced by interactions that are not preceded by real actions between

negotiators. For example, adjusting one's preferences can be caused by indirect actions such as news paper articles, experiences from former interactions, interactions with other actors that are not involved in the negotiation (such as e.g. pressure groups). The interactions as shown in Figure 4.2 refer to real interactions between negotiators and are subject of this study. Interactions that are not preceded by real actions between negotiators are not shown in this figure but may play a role when decision makers form preferences.

The second distinction of interactions can be made by defining the type of entity with whom the interaction takes place. Studying negotiations is mostly concerned with interactions between two or more negotiators with different interests. Regarding retail planning, interests of the stakeholders involved differ. To reach an agreement these stakeholders exchange viewpoints, arguments and other additional information, the focus of this study. Within each stakeholder group, group members may also interact to develop a common view. Interactions between group members belonging to the same (professional) group have been subject of study before. For example, social scientists investigated whether some form of interaction may explain the often reported descriptive finding that members belonging to the same group tend to behave similarly. Such interactions may be called "social norms", "neighbourhood effects" or "herd behaviour" (for a detailed explanation of these concepts see: Johnson & Johnson, 2006). Interactions between members of one stakeholder group involved in retail planning will take place and may influence the preferences before and during the negotiation process with other stakeholders. Although not subject of this study, it is important to be aware of all types of interactions to be able to explain preference formation.

4.3.2 Power relations and interactions

Let us assume two (or more) negotiators deciding on a particular topic, influencing each others preferences by interacting (communicating, arguing, sharing knowledge). How to explain the degree of influence while interacting? There is a rich body of literature in the field of behavioural decision and negotiation theory that explains real decision behaviour of individuals, groups and individuals within groups (e.g. Neale & Bazerman, 1991; Raiffa, 2002; Thompson, 2006; Newell, Lagnado & Shanks, 2007). Power relations play an important role within interactions. The decision maker who is influenced the most by other decision makers while forming their own

preference structure is the least influential. The less someone's preference structure can be explained by preferences of others, the stronger someone holds onto its own preferences, thus the stronger its influence. In the literature, there are several motives known why decision makers persist in their viewpoint or just concede on particular points. Without claiming to be complete, the most important determinants of power are discussed.

- Future obligations: Decision makers may accept a less than ideal outcome in the short run in order to maximise the opportunity in the long run to establish an ongoing relationship between negotiators. Hensher & Puckett (2007) call this the shadow value of the relationship of negotiators. This shadow value represents the benefit that a decision maker believes a particular negotiation act would have on future negotiations. In a manner consistent with prospect theory (Kahneman & Tversky, 1979), the shadow value is specified such that potential future losses are weighted more strongly than potential future gains. Potential losses of great significance are the termination of the relationship and an increasing lack of cooperation by the other decision maker in future negotiations. In real estate developments future obligations play a major role since developers and a local government often may need each other in future plans within the boundaries of the municipality. Depending on the situation, this will influence the degree to which stakeholders are willing to adjust their preferences.
- Authority: Especially in political and management sciences the role of authority within negotiations has been studied frequently. Some basic readings on this topic include Lukes (1974) and Bachrach & Botwinick (1992) both from a political perspective and Mintzberg (1994) from a management perspective. Mintzberg refers to the "system of authority", working via direct orders and decisions and via standardized procedures. Authority is laid down in rules and legislations. In the case of retail planning decisions, governments have the disposal of formal authority and can apply it by persisting in their viewpoints on retail planning concepts.

- Personal characteristics: Decision makers with particular personal characteristics may have better negotiation skills than others. However, Bazerman, Curhan, Moore & Valley (2000) and also Thompson (2005) came to the conclusion that, despite of hundreds of investigations, individual differences in negotiation do not explain much variance in negotiator behaviour. When individual differences do influence negotiation outcomes, they are swamped by other effects.

- Availability of resources: When in an imaginable situation two actors (the developer and the municipality) are willing to cooperate in a new retail development, actors still have to negotiate on topics such as the scale, feasibility and concept of the project. To realize a new retail development different resources have to come together. Burie (1982) argued that power strongly depends on the disposal of resources, since a building process can be characterized as an exchange process. Typical resources in this kind of negotiation processes are knowledge, capital, land and goodwill. Raiffa (2002) called this exchangeable way of negotiation the distributive aspect of negotiations. The availability of resources enforces the power position of actors involved in a negotiation.

- Impatience: As argued by Muthoo (2000), negotiators benefit from a fast negotiation process. If the duration of negotiations influences both parties in the same way, there are no implications for the power relations. However, if one decision maker experiences more disadvantage from a delay in the negotiation process than the other, the power relation is influenced. Rubinstein (1982) showed with a game experiment that the party with the most time pressure has the weakest position in the negotiation. In planning practice, we also can imagine situations where the developer has a weaker power position because of impatience. In circumstances where the developer bought the land to participate in future developments, a delay in the development process will make the project less profitable. When the land has been paid with borrowed money, the total costs of the rent will increase during the period of delay. In this situation, the local government will be more patience and will have a stronger power position.

- Outside options: Sometimes a negotiation process can be undermined by one or more parties having alternatives which can take away the necessity to reach an agreement with other parties. These so-called outside options (Muthoo, 2000) can cause negotiation processes to be cancelled prematurely if the alternative is sufficiently attractive for at least one of the negotiating parties. Having other – outside – options seems a logical predictor of a stronger power position as it can serve as a threat to the other party (Binmore, Shaked & Sutton, 1989; Pinkley, Neale & Bennet, 1994). When deciding on the planning of retail facilities, outside options can occur in several ways. In the past, governments used to play a substantial role as land and property owners. As land owners they were able to select the developer that is best qualified for the development, against the lowest price possible. This situation leads to a dominant position of the local government since it can grant the development to another developer. Developers may also have outside options when, for example, retailers are part of the negotiation process. Depending on local market circumstances, developers have the possibility to select from multiple (alternative) retailers looking for a suitable location.

- Asymmetric information: Asymmetry in relevant knowledge between parties influences power positions. A decision maker who is not fully informed might settle for less than one who has information on all relevant negotiation-specific aspects (Muthoo, 2000). The transfer of knowledge – for example of unknown motives – makes negotiations less efficient (Camerer, 2003). When planning retail facilities in out of town locations, information about the externalities of the plan may influence the decision making process. This information will not be clear right from the start of the decision making process. Also, this information can be biased (in favour of the initiator).

4.3.3 Cooperative versus competitive negotiation behaviour

Until now we assumed that someone's power position explains the degree of compliancy of a decision makers' behaviour in a decision making process, resulting in a manipulable preference structure. In reality, someone's power position is not the only predictor for compliancy. A decision maker can have substantial power and in the mean time show cooperative behaviour and adjust his or her preferences in order to reach a better joint outcome. An important condition for

power to appear is the degree to which interests or goals between actors are conflicting. The more conflicting, the more power may determine the decision making process. Interests can diverge without conflicting each other. For example, a developer's main interest with the development of a new out-of-town shopping centre is to realize a profitable project in terms of money. On the other hand, a municipality can reinforce its economic position with the realization of the same project. When the interests of decision makers harmonize, they are much more willing to cooperate than in a situation of conflict, despite a strong power position of one of the decision makers. If the interests of decision makers do not conflict, power is less important in the negotiation process. There is a high possibility of cooperation without any negotiation.

To summarize, adjusting preferences cannot only be explained by differences in power positions. Decision makers' inclination to compete or to cooperate because of its goals and interests is also an important predictor for preference adjustments. However, within one decision a decision maker can behave competitively and cooperatively at the same time (Neale & Fragale, 2006). This is especially the case when we deal with multi-attribute negotiations. Retail plans can be characterized as a bundle of attributes like location characteristics, size, represented shop formulas, parking facilities, etcetera. Because of this multi-attribute character, negotiating on retail plans is hard to compare with simple-attribute negotiations like for example the purchasing price of a second hand car. The interests for particular plan attributes will differ. Negotiators will be more compromising for attributes that are not within their field of interest.

Finally, also the perception of each other's power position may influence the degree of compliancy within a negotiation. Deciding whether to behave cooperatively or competitively depends, in part, on how one expects one's negotiation counterparts to behave (Corfman, 1991). From the literature (Neale & Fragale, 2006) it appears that when a negotiator's opponent signals that he or she has a cooperative orientation, negotiators are likely to become more cooperative. However, ample evidence shows that even experts are poor in making clinical assessments about another person's personality in order to accurately formulate an opposing strategy (Morris, Larrick & Su, 1999).

4.3.4 Adaptive behaviour

The purpose in this study is to reveal adaptive behaviour of decision makers involved in retail planning while forming their preferences. Adaptive behaviour within a negotiation context can be defined as the phenomenon that a decision maker adjusts his/her preferences towards the preferences of other decision makers within the negotiation process. As we previously stated, adjusting preferences does not always have to be the result of direct actions (or negotiation steps). Also without visible actions someone's preferences may depend on the preferences of others, due to (in section 4.3.1 defined) indirect interactions. In decision theory this phenomenon is described as interpersonal dependent preferences (e.g. Nida- Rümelin, Schmidt & Munk, 1996). It is plausible that decision makers involved in retail planning show interpersonal dependency while forming preferences. The preferences of stakeholders involved in retail planning may be influenced by indirect interactions such as experiences from former retail developments, (in)formal talks with other experts in the field of retail planning or following the national debate on this topic by reading newspapers and professional journals. Both direct and indirect actions may be reason to adjust decision makers' personal preferences.

Besides the distinction between direct and indirect actions causing adaptive behaviour, adaptive behaviour itself can be split in permanent and temporary adjustments of decision makers' personal preferences. Especially within negotiations decision makers may temporary adjust their personal or initial preference, only to move to consensus. The latter form of adaptive behaviour will be subject of the experiment in this study. In the next section, the approach most suitable to measure stakeholder's preferences and adaptive behaviour will be explained.

4.4 Modelling preferences and adaptive behaviour

Although there is a growing attention for econometric modelling of social interactions, standard decision theoretic models disregard the phenomenon of dependency of preferences (Nida-Rümelin *et al.*, 1996). Also others argue that further research is required to model interactions and interdependencies that characterize group decision making (Hensher & Puckett, 2007; Timmermans & Zhang, 2009). In this section it is motivated why choice modelling is the most

promising approach to measure preferences as well as adaptive behaviour in a retail planning context.

4.4.1 Multi-actor decisions and choice modelling

Since the late twentieth century non-cooperative game theory was adopted as a language and set of tools for the study of interactions. A considerable body of work uses non-cooperative game theory to model families and households as groups whose members may have differing objectives. During the last two decades, this game situation has been enhanced by a great number of studies and has been transferred to several bargaining and negotiation situations (for example, in the field of real estate and urban planning see Pfrang & Witting, 2008; Blokhuis, 2010; Samsura, Van der Krabben & Van Deemen, 2010). However, pure game theoretical approaches assume negotiations between two actors and a clearly defined, single-attribute negotiation issue. Decisions on retail planning involve multiple (more than two) stakeholders and include multiple attributes to be negotiated. Besides, some of these attributes (e.g. location or the variety of branches of new retail plans) are discontinuous (or discrete). This excludes approaches based on econometric modelling searching for Pareto-optimal joint agreements for decision topics that are reduced to one or two continuous variables. Examples of these kinds are Hämäläinen, Kettunen, Marttunen & Ehtamo (2001) who involved different interest groups negotiating about water levels of a regulated lake, and Sounderpandian, Frank & Chalasini (2005) which investigated how three stakeholders divide funding for brownfield redevelopments.

Discrete choice models offer a solution for dealing with discontinuous attributes. Discrete choice problems involve choices between two or more discrete alternatives. The utility of a multi-attribute alternative is not directly derived from products but from the properties or characteristics of these products or alternatives (Lancaster, 1966, 1971). Each alternative can be described as a bundle of objective features and people derive utility from these features. Discrete choice models are statistical procedures that describe choices made by people among a finite set of alternatives. The models are widely applied in the field of marketing, transportation, tourism and urban planning. The models have been used to examine choice behaviour of individuals e.g., travel behaviour (Hensher, 1994; Ben-Akiva & Bierlaire, 1999; Hensher & Sullivan, 2003), theme park choice behaviour (Kemperman, 2000), mass customization (Dellaert & Stremersch, 2005),

among numerous other applications. Discrete choice models are also used to examine choices by organizations, such as firms or government agencies. Examples are the investigation of strategic behaviour of retail firms (Oppewal, 1995; Oppewal *et al.*, 2000), location decisions by industrial firms (Leitham, McQuaid & Nelson, 2000) or businesses' willingness to pay to avoid drought water restrictions (Hensher, Shore & Train, 2006). The decision-making unit is often assumed to be one person or organization, though the concept is applicable more generally.

Recently the concept of choice modelling has also been applied to group decisions and negotiations within households (e.g. Borgers & Timmermans, 1993; Molin, 1999; Dosman & Adamowisc, 2006) and for example freight distribution decisions (Hensher, Pucket & Rose, 2007a). The approach used in Molin (1999), Dosman & Adamowisc (2006) and Hensher *et al.* (2007a) to infer a member's influence is first to measure his or her initial preference and then compare it with the group's preference as reflected by the decision outcome. If the group's preference is similar to the member's initial preference, the member is expected to have exerted a high influence on the decision outcome. Some choice modelling studies go even further and uncover behavioural aspects underlying these influence structures. Dellaert, Prodigalidad & Louviere (1998) studied misperception of other member's preferences and influences in joint family decisions. Aribarg, Arora & Bodur (2002) decomposed influence into two components: revision and concession. They demonstrated that converging preferences affects a member's satisfaction with the joint decision. In this study, we are specifically interested in the degree in which stakeholders in retail planning adjust their initial preferences towards the preferences of other stakeholders on the level of the attributes of a particular retail plan.

4.4.2 Using a conjoint experiment

Most studies using choice modelling in a group decision context also use conjoint experiments to collect data. Conjoint experiments, also known as stated choice (or preference) experiments, give researchers control over factors manipulated in the experiment (e.g. Louviere, Hensher & Swait, 2000). Conjoint experiments are conducted using a special type of survey. Respondents are invited to respond to imaginary choice situations, which can be viewed as integral descriptions of a set of choice alternatives. Typically, respondents are requested to choose between two or more alternatives. Because responses are observed for series of choices between alternatives that are

carefully constructed, one can statistically estimate the parameters of a choice model. In the past, experiments have been conducted which systematically vary not only the attributes of the choice options involved but also the preferences or choices of e.g. spouses (Krishnamurthi, 1988; Madrigal & Miller, 1996) or competitors (Oppewal *et al.*, 2000). In order to imitate real negotiation processes, choice experiments had to be extended.

Later, Brewer & Hensher (2000) developed a conjoint choice experiment incorporating real negotiation steps. These so called interactive agency choice experiments (called “IACE”) involve an iterative approach in which interdependent agencies may amend their stated preferences based on the preferences of agencies in the group. This process is repeated until either a consensus or impasse is reached. Although the proposed framework looks promising in terms of revealing interdependencies of decision makers, it is very time consuming and difficult to establish for a sufficiently large sample of agent pairs. Later, Hensher and co-workers suggested other measurement approaches that are capable of capturing the interactive element of choice without explicit interaction between agents. One general framework they proposed was labelled the interactive inference and integrative power model (IIIP) and can be structured as a sequence of two stages (Hensher *et al.*, 2007a). First, independent utilities are estimated in the conventional way. Next, estimates of the individual preference parameters are fixed and imported in a joint agent model that enables the researcher to measure power across agents. Within the broad IIIP model Hensher and co-authors defined the minimum information group inference (MIGI) method to obtain behavioural estimates (Hensher & Puckett, 2005). Unlike IACEs, MIGI does not involve an iterative process in which respondents are presented with information about the preference rankings given by each respondent. Here, respondents have to indicate how they would rank the alternatives if they had to attempt to reach agreement with the other member(s) of the group. Inspired by this research of Hensher and co-authors, a conjoint experiment seems to be a suitable approach to estimate retail plan preferences of multiple stakeholders and to examine if and how preferences are adapted in light of preferences of other stakeholders.

4.5 Conclusions

In this chapter the concept of multi-actor decision making was discussed. The differences between cooperative and non-cooperative group decisions were highlighted. It was explained that negotiation on retail plan proposals ought to be joint (cooperative) decisions although decision entities may also show non-cooperative behaviour. In this study, it is assumed that each stakeholder group involved in decisions concerning retail planning (local governments, developers and retailers), acts as a unitary decision entity, although we know that in practice negotiations within each stakeholder group also take place. It can be argued that during the negotiation process preferences of each decision maker may be influenced by interactions with other negotiators. However, preferences can also be influenced by interactions that are not preceded by real actions between the negotiators, such as interactions by media, other stakeholders that are not the negotiators (like pressure groups), or experiences with former interactions. This study focuses on the interactions between three groups of stakeholders with differing interests. While deciding on retail plans they may show adaptive behaviour. In this chapter, adaptive behaviour was defined as the phenomenon that a decision maker adjusts his/her preferences in accordance with the preferences of other decision makers. Adaptive behaviour can be split in permanent and temporary adjustments of decision makers' personal preferences. Especially within negotiations decision makers may temporarily adjust their personal or initial preference, only to move to consensus. To explain why decision makers may adapt their preferences, different reasons are discussed. First, power positions of the decision makers and his/her opponents could explain why a decision maker is willing (or not) to adapt its preferences. Moreover, it was discussed that differences in interest and differences in perceptions could explain adaptive behaviour. Since the purpose of this study is to measure adaptation effects by means of an experiment, this chapter ends with a motivation why to use choice modelling as an approach to measure this phenomenon. Choice modelling is a suitable approach because it can deal with multiple discrete attributes and can be applied in multi-stakeholder settings. In order to include adaptive behaviour within choice models, traditional modelling techniques as well as the data-collection techniques have to be extended. The next chapter explains the modelling technique in detail.

CHAPTER 5

MEASURING ADAPTIVE BEHAVIOR

5.1 Introduction

In the previous chapter it was argued that conjoint choice modelling is a suitable approach to analyze influence structures in retail planning decisions. To that end, we need to further develop this approach in order to measure how stakeholders adapt their personal preferences considering the preferences of other stakeholders during the decision making process. Quantifying this behaviour can be a difficult task because of the difficulty of capturing data on behavioural responses that are suitable for econometric modelling. Given this problem, it is not possible to collect revealed preference data, based on real planning decisions. Therefore, in this study an experiment is constructed in which stakeholders have to choose the retail plan they prefer the most for an imaginary city. The data collected with this experiment offers the possibility to measure personal preferences for particular retail plans that are defined in terms of levels of different attributes. Besides, by extending the choice context it is also possible to measure to what degree stakeholders are inclined to adapt their preferences to the preferences of others in order to reach consensus.

In this chapter, an extension of the conjoint choice modelling approach will be explained. Applying this approach to measure adaptive behaviour allows us to answer questions such as:

- Are private stakeholders more in favour of out-of-town retail planning compared to public parties?
- Are stakeholders within the decision making process inclined to adjust their choices to the choices of other stakeholders?

- Are public stakeholders sensitive to the choices of private stakeholders or are they the ones that persist in their view on retail plans?

In this chapter, first choice modelling techniques are described in more detail (section 5.2). In section 5.3 the construction of a conjoint choice experiment is explained. Section 5.4 explains how such experiments as well as the modelling techniques have to be extended to be able to quantify influence structures. Section 5.5 discusses some statistics measuring the goodness-of-fit of the models. The chapter ends with a brief conclusion.

5.2 Basic principles of choice modelling

In this section, the basic concepts of modelling discrete choice behaviour are discussed. It starts with an explanation of the nature of random utility models. Then, the most widely applied choice model, the multinomial logit model is discussed, as well as a more advanced model, the mixed logit model.

5.2.1 Random utility models

Discrete choice problems involve choices between two or more discrete alternatives, such as for example choosing which shopping centre to shop (e.g. Borgers *et al.*, 2006) or choosing between modes of transport (e.g. Chorus, 2007). Discrete choice theory is based on the idea that each product (or alternative choice) can be described as a bundle of product characteristics or attributes. This theory assumes that individuals derive utility from these attributes when making a choice out of a set of alternatives. However, a multitude of unobserved factors may influence choice behaviour. Moreover, perceptions and preferences may have some inherent randomness and typically are measured in imperfect ways. Random utility theory can be used to incorporate this randomness into choice models. The random utility approach finds its origin in the work by Thurstone (1927).

Random utility theory assumes that the utility U_i for an alternative retail plan $i \in \mathcal{A}$, (where \mathcal{A} is the set of all retail plans considered), consists of a structural component V_i and a random error component ε_i . Thus, the utility of a certain alternative i is expressed as follows:

$$U_i = V_i + \varepsilon_i \quad (5.1)$$

The random variation in the model can be caused by different sources including measurement errors, variations or disturbances in perceptual functions, unobserved influences in the measurement environment and instrumental errors. The structural component depends on the way individuals combine their part-worth utilities. Typically, a linear compensatory model is assumed, which means that low evaluations of a particular attribute may be (at least partially) compensated by high evaluations of one or more of the remaining attributes, as follows:

$$V_i = \sum_k \beta_k X_{ik} \quad (5.2)$$

where X_{ik} represents the values of each attribute level k of alternative i . β_k is a parameter indicating the contribution of attribute k to the utility of alternative i . $\beta_k X_{ik}$ is also known as the part-worth utility of alternative i . If one assumes that individuals demonstrate utility-maximizing behaviour, then the probability that alternative i is chosen over alternative j ($\forall j \neq i$) is expressed as:

$$\begin{aligned} P_i &= P(U_i > U_j), & \forall j \neq i \\ &= P(V_i + \varepsilon_i > V_j + \varepsilon_j), & \forall j \neq i \\ &= P(V_i - V_j > \varepsilon_j - \varepsilon_i), & \forall j \neq i \end{aligned} \quad (5.3)$$

Equation 5.3 shows that the probability that an individual chooses alternative i is equal to the probability that the systematic component (V_i) and its associated error component for alternative i (ε_i) is higher than the systematic component (V_j) and error component (ε_j) for all other alternatives in the choice set. Because it is not possible to observe ($\varepsilon_j - \varepsilon_i$) one can only make statements about choice outcomes up to a probability of occurrence (see Louviere, Hensher & Swait, 2000).

By making different assumptions about the distribution of the error component, a variety of probabilistic discrete choice models can be formulated. For example, Thurstone (1927) assumed a normal distribution for the random error component, which yields a probit model, while McFadden (1974) assumed a Gumbel distribution (Gumbel, 1958), which results in the Multinomial Logit (MNL) model, the most widely used choice model.

5.2.2 The Multinomial Logit model

The Multinomial Logit model is the model that arises from the random utility function if the error terms are independently and identically distributed (IID) according to a Gumbel distribution. Out of a total set of retail plans (\mathcal{A}), each decision maker is offered a choice set of J alternative retail plans. The probability that alternative i is chosen can be expressed by the following model form:

$$P_i = \frac{\exp(\mu V_i)}{\sum_{j=1}^J \exp(\mu V_j)} \quad (5.4)$$

where,

- P_i is the probability that alternative i is chosen from J alternatives
- V_i is the structural utility of alternative i ;
- μ is a scale parameter.

The scalar parameter (μ) is also known as the Gumbel scale factor. It is arbitrarily set to one when we deal with a single data set (Ben-Akiva & Lerman, 1985). Substituting equation 5.2 into this model and setting the scalar parameter to one leads to the following equation:

$$P_i = \frac{\exp(\sum_k \beta_k X_{ik})}{\sum_{j=1}^J \exp(\sum_k \beta_k X_{jk})} \quad (5.5)$$

The MNL model is a theoretically well-founded model that is easily estimated. Parameter estimates of the MNL model are typically obtained by using maximum likelihood procedures (see e.g. Hensher, Rose & Greene, 2005, pp. 310). With the use of software packages such as NLogit (Greene, 2007) an iterative procedure can be used to search for the values of the parameters that will maximize the likelihood function.

5.2.3 The Mixed Logit model

According to Train (2003), the multinomial logit model can only capture differences in tastes that vary systematically with respect to observed variables, while tastes that vary with unobserved variables or purely randomly cannot be handled. For example, the location of retail categories at peripheral locations is probably more important for retailers representing large store formats. If we observe the size of the store format retailers represent, we are able to make subsamples and estimate differences in tastes among subsamples. However, tastes of individuals also may vary for reasons that are not linked to observed characteristics, just because different people behave different. The Mixed Logit (ML) model is a highly flexible model and can obviate this limitation of the MNL model. The model can take into account random taste variation (e.g. Hensher *et al.*, 2005). Mixed logit models assume that individuals share the same kind of utility function, but vary in terms of the weights they attach to the attributes. Such taste differentiation is captured by estimating a distribution for each of the parameters of the utility function. Thus, the value of β differs for each decision maker. For each attribute, a random component ν_k is added with mean 0.0 and standard deviation σ_k . The random component ν_k can take on a number of distributional forms such as normal, lognormal or triangular. In this study, we assume a normal distribution because we do not have any reason to expect that the distribution of the error components is asymmetric (like a lognormal distribution) or have limited extreme values (like a triangular distribution). The equation for the structural utility then becomes:

$$U_i = \sum_k (\beta_k + \nu_k) X_{ik} + \varepsilon_i \quad (5.6)$$

The standard deviation of the v_k components (σ_k) can be estimated for each variable, in addition to the mean value (β_k). The probability that alternative i will be chosen, *conditional* on v_k can be described by the following multinomial logit form:

$$P(i|v_k) = \frac{\exp \sum_k (\beta_k + v_k) X_{ik}}{\sum_{j=1}^J \exp \sum_k (\beta_k + v_k) X_{jk}} \quad (5.7)$$

Equation 5.7 is the simple MNL model (see equation 5.5), but with the provision that, for each sampled individual we have additional information for each attribute level (variable) k defined by v_k . This additional information influences the choice outcome. The *unconditional* probability is obtained by integrating the random terms out of the probability:

$$P_i = \int P(i|v_k) f(v_k) dv_k \quad (5.8)$$

where,

- P_i is the probability that alternative i is chosen;
- $P(i|v_k)$ is the logit probability that a person chooses alternative i , conditional on v_k ;
- $f(v_k)$ is a density function for the distribution of the error terms regarding attribute k in the population;

Like the MNL model, the mixed logit model has been known for many years but has only become fully applicable since the advent of simulation methods. To calculate the choice probabilities, specialized simulation methods are required. Improvements in computer speed and in the understanding of simulation methods have allowed the full power of mixed logits models to be utilized (Train, 2003). Since these estimation methods are more tractable and integrated into the popular software packages (Hensher & Greene, 2003), an increasing number of applications of ML models have appeared in the literature. Recent applications of the mixed logit model in urban planning include e.g. Kemperman, Ponjé & Timmermans (2005) who analyzed trip making

of individuals to urban parks and Strazzera, Cherchi & Ferrini (2010) who evaluates public preferences over planning alternatives for an urban site of environmental interest.

5.3 Measurement approach

As already explained in the introduction of this chapter we used conjoint measurement to collect data that can be used to estimate the models discussed in the previous section. Conjoint measurement is based on responses made by decision makers in controlled hypothetical situations. In this section, the construction of a conjoint choice experiment in the context of retail planning is explained in more detail. In addition, the way the data can be analyzed is discussed.

5.3.1 Construction of a conjoint choice experiment

The conjoint choice approach asks decision makers to make actual choices between two or more hypothetical alternatives. The task for the individual is to select the alternative in each choice set that best reflects his or her preferences. Usually, a base alternative is included in the choice sets that individuals can choose when none of the represented alternatives is attractive enough to be selected. A simple example of a choice set representing different retail plan alternatives is shown in Figure 5.1. This example is based on the selection of 3 attributes (retail category A and B, and leisure facility C), representing facilities that can be added to the retail structure of a particular city. The levels correspond with the possible locations for these facilities (inner city, furniture strip and peripheral retail centre).

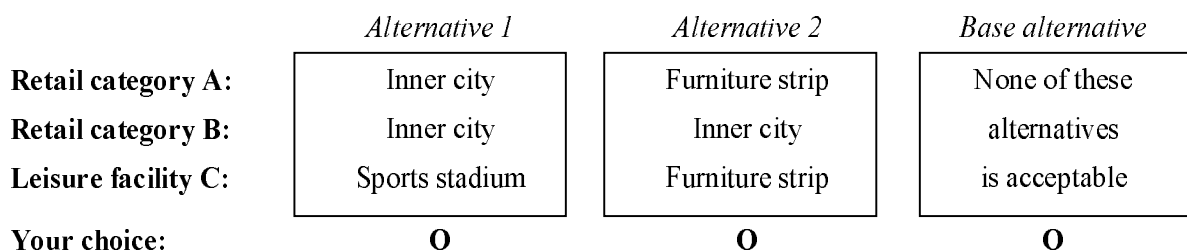


Figure 5.1 Example of a conjoint choice set

Once a set of attributes and their associated levels is determined one needs to develop a design to generate profiles that describe the alternatives. In general, a design is required in which there are no correlations between the attributes, thus all attributes must vary independently. This enables a correct estimation of the parameters and ensures that any effect can be assigned to a specific variable, without confounding this effect with any other variable. To accomplish a design in which the correlations between all attribute levels are equal to zero, full factorial designs can be used. A full factorial design contains descriptions of all possible combinations of attribute levels. It enables one to estimate all main effects and all interaction effects between attributes. However, if the number of attributes and attribute-levels increases, the number of hypothetical alternatives becomes extremely high. Fortunately, only a small subset of all possible combinations is required to estimate all main effects and a selection of interaction effects. This is accomplished by using fractional factorial designs (Montgomery, 1984). In a fractional factorial design, a subset of a full factorial design is used. The reduction of the number of alternatives implies that not all interaction effects can be measured. The best strategy is to choose a fractional design that estimates all main effects and first order interactions, where the main effects are independent of the interaction effects.

The alternatives form the basis of the questionnaire that will be offered to the individuals. Conjoint choice modelling depends on the integrity of the data collected from individuals, who may face some limitations in their ability to process information. If the task is too long, too difficult, or lacks sufficient reality, data quality will suffer and not contain the information sought. The issue of task complexity in relation to individual burden have been addressed by many authors (e.g. Stopher & Hensher, 2000; Wang, Jiuqun, & Timmermans, 2001; Arentze, Borgers, Timmermans & Del Mistro, 2003). To avoid loss of data quality the questionnaire has to be constructed with care. In our case, decisions have to be made regarding the number of choice sets and the way the complex decision problem (deciding on retail plans) is presented. In the next chapter, the questionnaire that has been used for the experiment with stakeholders involved in retail planning will be explained in detail.

5.3.2 Data preparation

Once the choice data have been collected, the data have to be prepared for modelling. Since the attributes are represented categorically, the attribute levels have to be recoded. There are three common ways to code attribute levels; dummy coding, effect coding and orthogonal coding (e.g. Louviere *et al.*, 2000). In this study, we applied dummy coding. The coding scheme for the retail plans is shown in Table 5.1. When dummy coding is applied, all attribute levels except one (the base level) are coded as 1 on their corresponding variable and 0 on all other variables. The alternative represented by the base level of each attribute is called the base alternative and is coded by a series of zeros on all attribute variables. The utility of the “None of these alternatives are acceptable”-option) is measured by a single variable: X_0 . For this alternative, all attribute variables are 0 by definition. A choice set, for example consisting of two retail plans and a ‘none’ option as shown in Figure 5.1, can be coded as shown in Table 5.2.

Table 5.1 Dummy coding

| Level | Effect 1 | Effect 2 |
|-------|----------|----------|
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 2 | 0 | 0 |

Table 5.2 Example coded choice set

| Retail Plan | category A | category B | leisure C | X_0 | X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{3A} | X_{3B} | Choice |
|-------------|------------|------------|-----------|-------|----------|----------|----------|----------|----------|----------|--------|
| Alt. 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Alt. 2 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| None | - | - | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The X -variables (gray shaded area) represent the coded effects of the attributes (retail category A, retail category B and leisure facility C) and the ‘none’ alternative. In this example, the variables representing the six attribute-levels are indexed (k) by 1A, 1B, 2A, 2B, 3A and 3B. For example, X_{3A} and X_{3B} represent the attribute levels of leisure facility C. Note that the attributes (retail category A, B and leisure facility C) come from an orthogonal design, being independent of each other by definition. Variable X_0 is the constant representing the utility of the ‘none’ option. By arranging the data of all the choice sets that are presented to the decision makers in the way that is shown in Table 5.2, the choice dataset can be used for model estimations. The dependent variable represents the discrete choices shown (as an example) in the last column of Table 5.2. The independent variables are the coded attribute levels and the constant for the ‘none’ option.

5.4 Measuring adaptive behaviour

The most important objective of the experiment in this study is to measure adaptive behaviour of stakeholders involved in retail planning. The question is whether decision makers are inclined to adjust the utilities attached to retail plan attributes when they know the viewpoints of other stakeholders involved in the decision making process. The phenomenon that a stakeholder adjusts its utilities towards the preferences of the other stakeholders within the decision making process is called adaptive behaviour. To be able to measure adaptive behaviour, the context of the choice experiments has to be enriched. Therefore randomly generated viewpoints of the other stakeholders were added to the decision context.

The general idea of adaptive behaviour is that a decision maker adapts his or her part-worth utilities to the preferred options of other stakeholders. To be able to estimate the effects that preferred options of two other stakeholders (defined as S1 and S2) have on the decision maker’s part-worth utilities, additional variables have to be introduced in the coded choice dataset from Table 5.2. These additional variables (called adaptation variables) measure how the part-worth utility of each attribute level of a decision maker is influenced by the other stakeholders’ preferred options adjust. If the decision maker (DM) knows the preferred option of S1, the decision maker may (temporary) adjust his/her own part-worth utilities about the retail plans in order to find consensus. Maybe, (s)he wants to adhere to S1’s choices. In that case, the

decision maker may attach more utility to the alternative chosen by S1 and decrease the utility of the other alternatives.

The choice set example of Figure 5.1 is used to clarify this principle. Assume for a moment that only stakeholder 1 is involved in the decision making process and that the decision maker wants to be cooperative (adhere to S1). If S1 prefers the first alternative the decision maker may try to increase the utility of the first alternative. In this particular case, this can only be done by increasing the part-worth utility of $X_{1,1A}$ and $X_{1,2A}$. Also, the decision maker may try to decrease the utility of the other alternatives. This principle is shown in Table 5.3. The upward pointing arrows indicate that the decision maker is willing to increase these part-worth utilities while the downward pointing arrows indicate that the decision maker is willing to decrease the part-worth utilities of the other alternatives.

Using the same reasoning, if S1 prefers the second alternative, the decision maker may increase the part-worth utilities of the second alternative and decrease the part-worth utilities of the other alternatives as is shown in Table 5.4.

Table 5.3 Example I, coded choice set with adaptation effect

| Retail Plan | X_0 | X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{3A} | X_{3B} | Choice S1 |
|-------------|-------|----------|----------|----------|----------|----------|----------|-----------|
| Alt. 1 | 0 | 1↑ | 0 | 1↑ | 0 | 0 | 0 | 1 |
| Alt. 2 | 0 | 0 | 1↓ | 1↓ | 0 | 0 | 1↓ | 0 |
| None | 1↓ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 5.4 Example II, coded choice set with adaptation effect

| Retail Plan | X_0 | X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{3A} | X_{3B} | Choice S1 |
|-------------|-------|----------|----------|----------|----------|----------|----------|-----------|
| Alt. 1 | 0 | 1↓ | 0 | 1↓ | 0 | 0 | 0 | 0 |
| Alt. 2 | 0 | 0 | 1↑ | 1↑ | 0 | 0 | 1↑ | 1 |
| None | 1↓ | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

To increase the part-worth utility of an attribute level of a particular alternative, the corresponding β -parameter should be increased, and to decrease the part-worth utility, β should be decreased. As shown in Tables 5.3 and 5.4, this may introduce contradictive conditions: the β -parameter for X_{2A} should be increased and decreased. Therefore, we assume the DM will not change the β -parameters for the X_{2A} -variable in these cases.

If S1 prefers the ‘none’-option, the decision maker will increase the part-worth utilities of this alternative by adding a positive value to the marginal utility of X_0 , and negative values to the part-worth utilities of $X_{1,1A}$, $X_{2,1B}$, $X_{1,2A}$, $X_{2,2A}$ and $X_{2,3B}$, as illustrated in Table 5.5.

To estimate the values the DM wants to add (or subtract) to the utility components, we have to consider these values as parameters, which can be estimated by adding variables to the dataset. These variables have to be specified as shown in (Table 5.6).

Table 5.5 Example III, coded choice set with adaptation effect

| Retail Plan | X_0 | X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{3A} | X_{3B} | Choice S1 |
|-------------|-------|----------|----------|----------|----------|----------|----------|-----------|
| Alt. 1 | 0 | 1↓ | 0 | 1↓ | 0 | 0 | 0 | 0 |
| Alt. 2 | 0 | 0 | 1↓ | 1↓ | 0 | 0 | 1↓ | 0 |
| none | 1↑ | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Table 5.6 Coded choice set with adaptation variables

| Retail Plan | X_0 | X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{3A} | X_{3B} | Choice S1 | A_0 | A_{1A} | A_{1B} | A_{2A} | A_{2B} | A_{3A} | A_{3B} |
|-------------|-------|----------|----------|----------|----------|----------|----------|-----------|-------|----------|----------|----------|----------|----------|----------|
| Alt. 1 | 0 | 1↓ | 0 | 1↓ | 0 | 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 |
| Alt. 2 | 0 | 0 | 1↑ | 1↑ | 0 | 0 | 1↑ | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| None | 1↓ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 | 0 |

Now, the additional adaptation variables can be added in the utility expression. Initially, according to Equation 5.2, for each alternative retail plan and for each Decision Maker (DM) the utility according to the MNL model can be written as:

$$U_{DM,i} = \beta_{DM,0}X_{i0} + \beta_{DM,1A}X_{i1A} + \beta_{DM,1B}X_{i1B} + \dots + \beta_{DM,3B}X_{i3B} + \varepsilon_i \quad (5.9)$$

where $\beta_{DM,k}$ represents the marginal utility of variable k of alternative i for decision maker DM . Note that the k -subscripts represent the indices 1A, 1B, 2A, 2B, 3A, 3B. The constant $\beta_{DM,0}$ measures the utility if the ‘both retail plans are not acceptable’-option. To identify the influence of the viewpoints of other stakeholders, adaptation variables (A) are introduced in the utility expression:

$$\begin{aligned} U_{DM,i} = & \beta_{DM,0}X_{i0} + \beta_{DM,1A}X_{i1A} + \beta_{DM,1B}X_{i1B} + \dots + \beta_{DM,3B}X_{i3B} \\ & + \alpha_{DM,0}^{S1}A_{i0}^{S1} + \alpha_{DM,1A}^{S1}A_{i1A}^{S1} + \alpha_{DM,1B}^{S1}A_{i1B}^{S1} + \dots + \alpha_{DM,3B}^{S1}A_{i3B}^{S1} \\ & + \alpha_{DM,0}^{S2}A_{i0}^{S2} + \alpha_{DM,1A}^{S2}A_{i1A}^{S2} + \alpha_{DM,1B}^{S2}A_{i1B}^{S2} + \dots + \alpha_{DM,3B}^{S2}A_{i3B}^{S2} \\ & + \alpha_{DM,0}^{S1 \times S2}A_{i0}^{S1 \times S2} + \alpha_{DM,1A}^{S1 \times S2}A_{i1A}^{S1 \times S2} + \alpha_{DM,1B}^{S1 \times S2}A_{i1B}^{S1 \times S2} + \dots + \alpha_{DM,3B}^{S1 \times S2}A_{i3B}^{S1 \times S2} \\ & + \varepsilon_i \end{aligned} \quad (5.10)$$

Using this model specification, we can estimate the effects of Stakeholder 1 as $\alpha_{DM,1A}^{S1}$, $\alpha_{DM,1B}^{S1} \dots \alpha_{DM,3B}^{S1}$. The β_{DM} -parameters are adjusted by the α_{DM}^{S1} -parameters to measure the influence of S1’s preference on the decision maker’s part-worth utilities. A similar set of α_{DM}^{S2} -parameters can be estimated to measure how Stakeholder 2 affects the part-worth utilities of the decision maker. In addition, interaction between S1 and S2 may be relevant as well. If both S1 and S2 opt for the same alternative in the choice set, the decision maker may be prepared to add even more (or less) weight to the variables. These combined effects between S1 and S2 can be measured by estimating $\alpha_{DM}^{S1 \times S2}$ -parameters.

5.5 Validity

As explained before, to estimate the parameters in a choice model maximum likelihood estimation is used. The log-likelihood function can be defined as:

$$LL(\beta) = \sum_{DM} \sum_q \sum_i y_{DM,qi} \ln(P_{DM,qi}) \quad (5.11)$$

where DM and q identify a decision maker and a choice set respectively. The value of y_{DMqi} is equal to unity if decision maker DM was observed to choose alternative i from the q^{th} choice set. In fact, the loglikelihood is equal to the natural logarithm of the predicted probabilities of the chosen alternatives, summed across all choices of all individual decision makers. Because the maximum value of a probability is unity, and $\ln(1)=0$, the maximum value of $LL(\beta)$ is zero. However, $LL(\beta)$ has no theoretical minimum value. Therefore, to assess the performance of a choice model, a reference value is defined as:

$$LL(0) = \sum_{DM} \sum_q \ln(1 / N_{DMq}) \quad (5.12)$$

where N_{DMq} is the number of alternatives in choice set q presented to decision maker DM . This equation implies that all alternatives in the choice set have equal probabilities to be chosen. This will happen if all parameters are equal to zero. Such a model is usually called the null-model. By taking $LL(0)$ as the reference value, a goodness-of-fit measure can be defined as (McFadden, 1974):

$$Rho^2 = 1 - [LL(\beta) / LL(0)] \quad (5.13)$$

By optimizing the β -parameters such that the predicted choice probabilities represent observed choices as closely as possible, the optimal value of Rho^2 can be determined. According to Hensher *et al.*, (2005, pp. 338), a Rho^2 of 0.3 or higher represents a decent fit for a discrete choice model. However, according to Louviere *et al.* (2000) values between 0.2 and 0.4 may be considered to be indicative of extremely good model fits. To be able to compare Rho^2 -values of

different models also the number of estimated parameters has to be considered. From two models estimated on the same choice-data set with similar Rho^2 -values but a different number of parameters, the model with the smaller number of parameters is preferred. Greene (2007) defines an adjusted Rho^2 taking into account the number of parameters as well as and the number of choice alternatives (see equation 5.14).

$$Rho^2_{Adjusted} = 1 - \left\{ \left[\frac{TNA}{TNA - Npar} \right] * \left[1 - Rho^2 \right] \right\}$$

$TNA =$ total number of alternatives across all choice sets (5.14)

$Npar =$ number of estimated parameters

To compare the fit of two models, one of which is nested within the other, the likelihood ratio test (Theil, 1971) can be used:

$$G2 = -2[LL(0) - LL(\beta)] \quad (5.15)$$

The test statistic ($G2$) is twice the difference in the log likelihoods of the estimated model $LL(\beta)$ and the reference model (here the null model: $LL(0)$). To determine whether the estimated model is superior to the reference model, the $G2$ value obtained is compared to the critical Chi-square value with degrees of freedom equal to the difference in the number of parameters estimated for the two models. If $G2$ exceeds the critical Chi-square value for the chosen significance level, then the analyst rejects the null hypothesis that the estimated model is not better than the base model (Hensher *et al.*, 2005). The test requires nested models, that is, models in which the more complex one can be transformed into the simpler model by imposing a set of linear constraints on the parameters.

5.6 Conclusions

In this chapter it is argued how conjoint choice modelling techniques can be used as an approach to measure adaptive behaviour in multi-actor decision situations including retail planning decisions. The three most important stakeholders involved in retail planning decisions in the

Netherlands are developers, retail organizations and local governments. It is assumed that the preference of one stakeholder for the location of particular retail brands at different locations (peripheral or inner city) may be influenced by the viewpoints of other stakeholders within the decision making context. The tendency to adapt one's choices to the preferences of other stakeholders is called adaptive behaviour in this study. To measure this adaptive behaviour as well as the main preferences in retail planning for the three stakeholders we proposed a conjoint experiment where stakeholders have to choose for their most preferred retail plan. We also proposed to randomly generate the other stakeholders' viewpoints and add these to the decision making context. The data collected with such an experiment will be used to estimate different choice models. Besides the commonly used MNL model also the Mixed Logit model will be used to measure taste variations. In the next chapter, the conjoint experiment that was used for data-collection will be explained in detail.

CHAPTER 6

A CONJOINT EXPERIMENT TO MEASURE ADAPTIVE BEHAVIOR

6.1 Introduction

This chapter describes the design of a conjoint experiment that is developed to measure the preferences for the location of new retail facilities of different stakeholders involved in retail planning. This experiment is designed to allow analyzing whether stakeholders' part-worth utilities are influenced by the preferences of other stakeholders within the decision making process. With this purpose in mind, as discussed in the previous chapter, a traditional conjoint choice experiment is extended with a second part in which we give the decision maker additional information about the preferences of other stakeholders.

The next section of this chapter explains the context of the decision making and the precise choice task. Section 6.3 motivates why a web-based instrument is chosen to carry out the experiment and collect the data. It also describes the design of this instrument. The chapter ends with a brief conclusion.

6.2 Retail planning decisions as a choice task

To conduct a conjoint experiment, first the decision context has to be defined. As discussed in chapter 2 of this thesis, the decision to expand the supply of retail facilities in a particular city is a decision that - in the Dutch context - takes place on a local policy level. The main actors that are involved in such a decision are representatives of the local government, retail organizations and real estate developers. It is assumed that they may all have different opinions about the best way

to expand retail supply in a particular city. By using a conjoint choice experiment it is possible to measure preferences of different actors for different expansion strategies of retail supply. In order to carry out the conjoint experiment an imaginary city called “Shop City” was created. The features of “Shop City” are strongly related to an existing city in the Netherlands, although the map and the retail locations are slightly different. It is expected therefore that respondents will not refer to a real Dutch city when they complete the questionnaire.

Respondents were told that “Shop City” is a medium sized city (100.000 inhabitants) located in the centre of the Netherlands. The market position of “Shop City” in the non-daily retail supply is weak compared to other medium sized cities. Market research has shown that it is feasible to enlarge retail supply in this city. There are three possible locations for the expansion of retail facilities; 1) adjacent to a sport stadium, 2) an expansion of a furniture strip and 3) the inner city. The sport stadium as well as the furniture strip already exists. The furniture strip encloses momentarily 30.000 square meters of do-it-yourself and living/furniture retail facilities. Figure 6.1 shows a map of “Shop City”. The accessibility of both peripheral locations is equal.

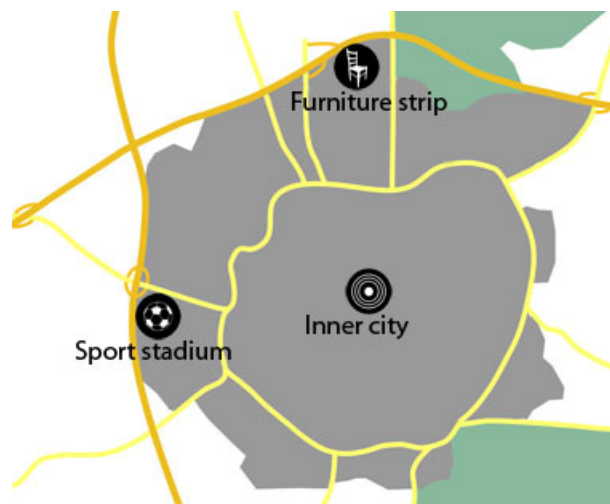


Figure 6.1 Map of imaginary city “Shop City”

During the entire experiment this decision context remains the same. What differ are the locations of the retail categories in which retail supply in “Shop City” can be expanded. Expansion of retail supply is possible in three retail categories:

- Toys and sporting goods (2.500 sq. m.)
- Home electronics and media (5.000 sq. m)
- Fashion (7.500 sq. m.)

The choice options reflect typical current retail development, in nature and size, in the Netherlands. In the present debate on retail planning in the Netherlands, the location of expansions in these retail categories is being discussed frequently. The former planning regime did not allow these retail categories to be located outside the hierarchical retail structure. However, since the introduction of the “Nota Ruimte”, these space consuming retailers are allowed to start business at other (peripheral) locations. We assumed that at least one large-scale store should fit the total volume of a particular brand. Moreover, the total volume (the volumes of all retail categories summarized) for a particular location should represent a realistic, autonomous expansion of the retail supply. To meet these conditions the choice context is tailored according to similar retail expansions in Dutch cities.

The three retail categories are the first three attributes of the experimental design used to generate alternative retail developments. The fourth attribute is the presence of a restaurant. Respondents were told that this restaurant is part of a new national chain of self-service restaurants with a surface of 1.000 sq. meters. The restaurant offers high quality fresh food. It has got extended opening hours: from 8 am till midnight. A playground for children is included in the restaurant. The idea is that adding a restaurant will strengthen the position of a (new) peripheral retail location. The retail location will become more attractive for consumers since they can combine shopping with having lunch, dinner or a coffee break. This will directly contribute to the length of stay of consumers and indirectly to the amount spent. It is only possible to add a restaurant on the two peripheral locations (sport stadium and furniture strip) because it is assumed that the supply of restaurants in the inner city is already sufficient. The attributes and levels used in the experiment are presented in Table 6.1.

Table 6.1 Selected attributes and levels

| Attributes | Levels |
|---|---|
| 1 Toys and sporting goods (2.500 sq. m.) | - peripheral location sport stadium - peripheral location furniture strip - inner city |
| 2 Home electronics and media (5.000 sq. m.) | - peripheral location sport stadium - peripheral location furniture strip - inner city |
| 3 Fashion (7.500 sq. m.) | - peripheral location sport stadium - peripheral location furniture strip - inner city |
| 4 Restaurant (1.000 sq. m.) | - peripheral location sport stadium - peripheral location furniture strip - no restaurant |

The levels of the attributes were combined to create plans for possible expansions of the retail structure of “Shop City”. Given the attributes presented in Table 6.1, in total $3^4 = 81$ different alternatives for expansion of the retail supply of “Shop City” can be composed. This number is too large to handle for respondents. Therefore, a 1/3 orthogonal fraction of the full factorial design was selected to reduce the number of alternatives. This resulted in a set of 27 alternatives. These alternatives were used to create choice tasks. The choice task was presented to respondents in two phases. First, respondents were invited to choose between two alternative retail development plans without additional information; next, they had to choose between plans with additional information about the preferences of the other stakeholders. In the next section, the design of the experiment will be explained in detail.

6.3 An instrument for data-collection

Compared to revealed preference studies, measuring stated preferences or stated choices is more demanding in terms of instrument design and user interface. The reason is that the researcher has to make sure that the assumed preference or choice model is consistent with the experimental design. Since conjoint analysis has evolved over the last decennia, experiments have become

more complex (Timmermans & Hato, 2009). The number of attributes included in the experiment increased, approaches to estimate context-dependent utility functions were suggested and group models – in addition to individual models - were developed. All these developments ask for new data collection strategies. This also holds for the experiment introduced in this chapter. Because several groups of stakeholders will take part in the experiment and stakeholders may influence the choices of others, a specific instrument had to be developed to collect the data.

It is recognized that the quality of the data depends on the motivation of the respondents to participate in the experiment and on their understanding of the choice task. A professionally designed, high quality, attractive interface may stimulate people participating in the data collection. To meet these requirements a Web-based interface was chosen to collect the data. In this section, we first will elaborate on the advantages of a Web-based interface. Then, we will discuss how to visualize the choice profiles in a Web-based environment. Finally, we will show how the online-survey is compiled.

6.3.1 The advantages of a Web-based experiment

There are different ways to carry out a conjoint experiment. Traditionally, the choice tasks were presented to respondents using verbal descriptions. Choice sets were compiled carefully so that each respondent was offered different choice sets and each profile was presented in choice sets an equal number of times. Since Internet access has increased enormously over the last decade, the Internet has become a popular medium for surveys. Web-based experiments offer several advantages compared to written surveys. Generally Web-based surveys are popular because (Alsnih, 2006):

1. They are easier to execute. It is easy to send e-mail reminders to recruited respondents.
2. They allow faster response time. It enables reminders to be sent sooner rather than later and this should positively affect response rates.
3. Data entry is automatized which saves time and other resources, and increased the likelihood of correct data entry. Automation of data entry allows for a dynamic error checking ability.
4. They are cheaper, especially if large samples are required.

Other advantages can be mentioned. Internet-based surveys can supply metadata in addition to the responses given to the survey questions: a reconstruction of the response process (Bosnjak & Tuten, 2001). The use of Web-based environments allows collecting data about the respondents not completing the questionnaire, since it is registered precisely when a respondent, once started the questionnaire, decides to quit. Besides, the time it took to complete the questionnaire and the exact moment of participation can be registered. Another reason to choose a Web-based instrument is that respondents (experts in the field of retail planning) are highly educated professionals working in a business where using Internet is widely accepted. It may be expected therefore that a Web-based survey will contribute to a high response rate. If a personal email-address is available, using the Internet is the easiest way to get in touch with these experts and is less time-consuming for both, researcher and respondent. Moreover, Web-based surveys offer the possibility to develop visually attractive interfaces motivating the respondent to participate and help them to better understand the purpose of the data collection and the set of attributes (Timmermans & Hato, 2009). Finally, using the Internet is especially interesting for stated choice experiments because it allows the automatic randomization of choice sets. This reduces the burden associated with the randomization of choice sets in written surveys, which require numerous forms of the same survey to be printed to compose randomized choice sets.

For the type of experiment proposed in this research, a Web-based survey seems therefore the most appropriate instrument. A disadvantage, however, are coverage problems occurring when results of a Web-based survey can not be generalized because only a part of the population have entrance to, or is familiar with, the Internet (see e.g. Cook, Heath & Thompson, 2000). Since the participants of the experiment in this research are all familiar with the use of Internet, and the group of respondents will be selected carefully (see section 6.4) this bias will likely be small.

6.3.2 Visualizing attributes and levels

To gain a clear insight into the choice behaviour of the respondent, the hypothetical retail scenarios have to be as realistic as possible to ensure that the respondent is making a 'real' decision. Visualization may induce people to participate in the data collection and be motivated. Some researchers have used pictorial presentations to visualize attributes and levels (e.g. Vriens

et al., 1998; Jansen *et al.*, 2009). It may be expected that a pictorial presentation of attributes leads to a more reliable and valid measurement of utilities. However, visualization and attractive user interfaces may also cause biased information processing. If the visualization contains elements, not relevant to the task, that trigger particular responses, the measurement may be biased. This may be especially true if visual information is added to verbal expressions. Moreover, abundant visualization may trigger the idea that the data collection is more a game than a serious attempt to mimic actual decision making in a survey or experimental setting.

The issue of how to best represent attribute levels in conjoint studies has been examined by for example Arentze, *et al.* (2003), Orzechowski, Arentze, Borgers & Timmermans (2006) and Mambretti (2007). Orzechowski *et al.* (2006) let two sub-samples, assumed homogeneous, complete a conjoint choice experiment about housing preferences. One sub-sample was asked to complete a conjoint choice task, in which only a verbal description of housing attribute levels was given. The other sub-sample completed a conjoint choice task, which allowed them to inspect the housing design options in virtual reality. The results of the study indicated the lack of any significant difference between the two conjoint choice models in terms of internal and external validity. This suggests that the elicitation of housing preferences, at least in their study, is not strongly influenced by presentation style, in the sense that (more) biased utility estimates would be obtained for any particular presentation style.

In a study on safety in urban parks, Mambretti (2007) found that different colour schemes used in the visualization had a significant effect on the estimated effects of park attributes on judgments of safety, suggesting that the use of visualization may trigger different, unintended attribute processing processes, leading to less reliable results. Finally, Arentze *et al.* (2003) were interested in the effect of using icons instead of verbal descriptions on the reliability of conjoint estimates for less-literate respondents. The choice of transport mode for work trips from a suburb to the CBD of Pretoria (South Africa) was considered as a case. They found that adding pictorial material to a verbal description of attributes has neither an impact on error variance or measurement of attribute weights. The effort it takes to develop and present pictorial material, therefore, is not compensated by better quality data, at least, not in that particular study. As summarised by Timmermans & Hato (2009), none of these studies proved that visualizing attributes leads to better preference estimates. Nevertheless, a major advantage of using pictorial stimuli is that respondents do not have to visualize potentially large quantities of information and

therefore should be able to more efficiently process a larger number of attributes. Moreover, pre-processing respondents with visual information leads to a better choice task involvement of the respondent (Orzechowski, 2004).

Because the context of the choice task in the present study contains a lot of information, we decided to apply pictorial presentations. Icons were used to explain the attributes in the choice task. For the representation of each branch, icons were used in different colours as illustrated in Figure 6.2. The size of the icon represents the size of the branch (except for the restaurant). In the experiment respondents have to choose the best suitable retail plan out of two. The use of icons instead of verbal expressions allows the respondents to quickly capture the differences between the two retail plans. This will contribute to the number of choices each respondent is able to make in the experiment. A map of “Shop City” as shown in Figure 6.1 was used to present the locations of possible expansions of retail supply. Also because the stakeholders involved in the experiment are familiar with reading maps, it was decided that using a map is the most appropriate way to present “Shop City”. To avoid biases, the map of “Shop City” was kept as simple as possible and did not show irrelevant information.





| | | | |
|---|--------------------------|----------------------|--|
| 1 | Toys & sporting goods | 2.500 m ² |  |
| 2 | Home electronics & media | 5.000 m ² |  |
| 3 | Fashion | 7.500 m ² |  |
| 4 | Restaurant | 1.000 m ² |  |

Figure 6.2 Icons used to present retail categories

6.3.3 Designing a Web-based questionnaire

To compile this questionnaire an in-house developed system called PAULINE³ was used. This is a general platform for designing Web-based questionnaires. In addition to data management and Web-based communication, the platform has several templates and mechanisms for composing survey and interactive computer experiments. One such template allows creating choice sets and randomizing choice sets across respondents.

The questionnaire starts with an explanation of the characteristics of “Shop City”. A lot of attention was given to the lay-out of these web pages. To make sure that respondents were informed quickly and correctly, the information about “Shop City” was presented on exactly one full screen. The respondent did not have to scroll. Appendix 1 shows screen plots of the questionnaire. After explaining “Shop City”, the first part of the experiment starts. First, an example of the choice task is given to familiarize the respondent with the choice task. Other studies (e.g. Orzechowski, 2004) have found evidence of a positive effect of what they called pre-experimental training. The findings of this study imply that it is better to spend more time on pre-experimental training of respondents rather than on saving time by asking subjects to start with the choice experiment immediately.

Next, each respondent was shown 15 combinations of two alternative retail plans. Each alternative was presented with an image of the map of “Shop City”. For each alternative the retail categories were distributed differently among the locations, illustrated by icons representing each retail category. Each time the respondent goes to the next choice task, two alternatives out of the 27 alternatives in total were selected randomly. Also in this part of the questionnaire all the information is presented on one screen, so that the respondent does not have to scroll down and choices can be made quickly. It is assumed that this will encourage the enthusiasm of the respondent and will increase the response rate. The respondent was asked to choose the most preferable alternative from each choice task. The option “none of the alternatives are acceptable” was the third choice option. Figure 6.3 shows an example of a choice task in the first part of the experiment.

³ PAULINE stands for a Platform with Advanced Utilities for the Layout of INternet-based Experiments. The system is developed by Joran Jessurun (TU/e).



Figure 6.3 Example choice task first part experiment

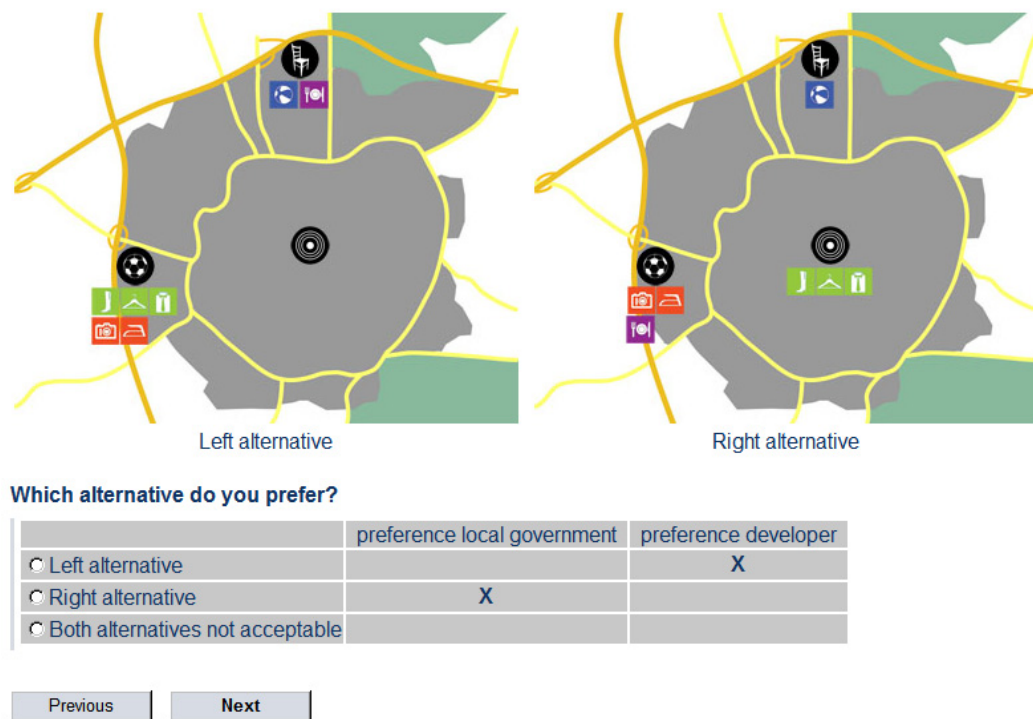


Figure 6.4 Example choice task second part experiment

In the second part of the questionnaire also the preferences of the other stakeholders in the decision making process were given. The respondents were asked the same question as in the first part of the experiment. They had to select the most preferable alternative from a set of two randomly chosen retail plans. Again, respondents made 15 choices. This part of the experiment looks very much the same as the first part except for the preferences of the others stakeholders that are presented. Figure 6.4 shows an example of the choice task for a retailer. Here, the choices of the developer and the local government are shown to the respondent. The choices of the other stakeholders were generated randomly. Respondents are able to recall the information about the characteristics of “Shop City” on each page of the questionnaire by clicking on a link.

In the last part of the questionnaire respondents were invited to provide details about their profession, experience, characteristics of the organization and some personal characteristics such as age and gender. In addition, retailers were asked in which line of trade they are doing business. Planners representing local governments were asked to indicate the size of the municipality as an additional question.

6.3.4 Testing the Web-based questionnaire

The instrument was tested with two different groups of students acting like retail planning experts. The main purpose of this testing phase was to find out how many choice tasks could reasonably be presented. The choice task seemed to be relatively simple, however, with increasing number of choice tasks, a certain degree of nonchalance could be observed. We searched for the maximum amount of choices without risking indifference among respondents. For the final version of the survey we chose for fifteen choice tasks for both parts of the experiment. Before sending the survey to the respondents, the final version was tested among several professionals to test if indifference appeared. It was concluded that two times fifteen choice tasks was feasible. Moreover, the testing phase helped to recognize problems with incompatible browsers and the download-speed. These could be removed easily.

6.4 Conclusion

This chapter described the design of the conjoint experiment to investigate preferences and adaptive behaviour of stakeholders deciding on retail planning alternatives. The choice task is based on an imaginary city called “Shop City”. Respondents representing three different stakeholder groups (developers, retailers and local governments) are presented a number of choice tasks to measure their preferences regarding retail scenarios reinforcing the retail structure of “Shop City”. In contrast to the first part of each questionnaire, information about preferences of other stakeholders is provided in the second part.

A Web-based instrument was developed to collect data. A major advantage of such instruments is the possibility to develop visually attractive interfaces that motivate respondents to complete the questionnaire and to check and store data online. For the explanation of the choice sets a simple map of “Shop City” with icons representing the attributes and levels was used.

CHAPTER 7

DATA-COLLECTION, RESPONSE RATES AND RESPONDENT PROFILES

7.1 Introduction

Using the online experiment that was discussed in Chapter 6, data was collected among three groups of stakeholders who are involved in retail planning decisions (developers, retailers and local governments). Before presenting the results of the estimated models giving insight into the preferences regarding new retail locations and adaptive behaviour of decision makers, in this chapter the data-collection procedure is explained and more details about the respondents are given. Although it is difficult to involve professionals in an experiment, we tried to get a group of respondents well representing the real decision makers. This enables us not only to draw conclusions about the modelling techniques but also about the real behaviour of these stakeholder and compare the results of the choices made with the actual discussion that is going on in the retail and real estate market in the Netherlands.

This chapter starts with the explanation of the data-collection procedure (section 7.1). Further it shows details about the response in section 7.2. In the third section of this chapter, the characteristics of the respondents are explained in detail.

7.2 Data-collection

In this section, the procedure of data-collection is described. It starts with details about the required sample size. Further the way respondents were selected and invited is explained. Response rates are also reported.

7.2.1 Sample size

Because the experiment consists of two parts, we administered two separate experiments. In the first part of the experiment only the preferences of the stakeholders for different retail plans were measured. The second part of the experiment was used for measuring adaptation effects. In this part, the choices of the other stakeholder groups were added to the choice task. An advantage for conducting two separate experiments was that every respondent should be able to complete more choice tasks in total. After the first part of the experiment there was a short intermezzo in the survey to explain the purpose of the second part. This should contribute to the understanding of the experiment as well as to the motivation of the respondents to fill out an additional series of choice tasks. In the testing round among students (see section 6.3.4) we found that two times 15 choices was the maximum number of choices to keep respondents interested and avoid nonchalance. To estimate reliable choice models we presumed, as a rule of thumb, that each alternative had to be judged at least 30 times. Because the alternatives are presented in pairs, consequently fifteen judgments are needed for each respondent. Since 27 alternative retail plans were compiled, it is easy to calculate that at least 27 respondents are needed for each stakeholder group to complete the experiment. This number is considered the minimum number of respondents per group, however, larger numbers were aimed for.

7.2.2 Selection and invitation of respondents

Different sources were used to recruit potential respondents. First, a membership list of the Dutch Council of Shopping Centres, including members of all three kinds of stakeholders (retailers, developers and local governments) was used. Especially developers were well represented in this list (163 names), which includes both postal and e-mail addresses. These developers were

contacted by mailing a personal letter that explained the purpose of the experiment. The link to the website was mentioned in the letter. The letter also contained a separate colour-printed sheet with an explanation of the characteristics of “Shop City”. This sheet served two purposes: (1) a teaser to visit the website and (2) a reminder to the characteristics of “Shop City” for the respondents participating in the experiment. Some addresses appeared to be out of date and some addressees indicated not to be willing to participate. The remaining 147 respondents were sent a personal e-mail the week after the invitation letter was sent. This strategy worked well. Out of these 147 developers, 67 (46%) visited the website and completed the entire questionnaire.

Because the membership list contained less retailers and local planners (resp. 44 and 24), other strategies were applied to recruit additional respondents from these groups of stakeholders. Regarding the retailers, with the help of our personal network, the number of respondents that was personally invited by letter could be increased from 44 to 88. In addition, 185 letters were sent to the headquarters of retail organizations. As far as e-mail addresses were available, these letters were followed by a personal invitation by e-mail (68) or by an e-mail to the general e-mail address of retail organizations (160). The number of completed questionnaires is equal to 36.

To collect data from local governments, another strategy was used. We contacted local governments by phone, explained the purpose of the experiment and asked for the responsible public servant. Depending on this conversation, personal letters or e-mails were sent directly to the representatives with a link to the online questionnaire. In total 132 representatives of local governments received a personal letter and up to 216 representatives received an invitation by e-mail. In addition, 62 letters were sent to local governments, inviting them to pass the letter to the servant responsible for local spatial planning. Eventually 67 representatives of local governments charged with retail planning completed the questionnaire. Table 7.1 shows the details regarding the response rates. The website was visited by 266 respondents from which 170 (64%) completed the entire questionnaire. This high percentage suggests that respondents, once they entered the website, felt encouraged to complete the experiment. We do not know the distribution of the 96 respondents who did not complete the questionnaire across the stakeholder groups.

Table 7.1 Response rates experiment

| | Invitation by personal letter | Invitation by personal e-mail | Invitation by letter to organization | Invitation by e-mail to organization | Visited website | Completed questionnaires |
|-------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------------|-----------------|--------------------------|
| Developers | 163 | 147 | 0 | 0 | unknown | 67 |
| Retailers | 88 | 68 | 185 | 160 | unknown | 36 |
| Local governments | 132 | 216 | 62 | 0 | unknown | 67 |
| Total | 383 | 431 | 247 | 160 | 266 | 170 |

The data was collected from May to September 2009. Because the starting and end time were registered by PAULINE, the average duration of the experiment can be calculated. On average, it took approximately 12 minutes to complete the questionnaire. This time did not differ significantly between stakeholders.

7.3 Characteristics of respondents

This section describes various background characteristics of the respondents in the samples of the three stakeholder groups. For each type of stakeholder, additional characteristics such as age, position in the firm were gathered. Besides stakeholder specific characteristics also some characteristics of the organization were explored such as the international focus of the development organization, the type of retail organization and the number of inhabitants of the municipalities that the planners are working for.

7.3.1 Developers

The profile of the respondents showed that most of the developers, specifically working in the retail sector in the sample, were men (88.1%). The average age of the developer that participated in the experiment was 40 years. The average experience of the developers was 10.8 years. This variable ranges from 1 year to 30 years of experience.

Table 7.2 summarizes some characteristics of the developers. The positions of the respondents within the organizations varied from “member of the board of directors”, “retail developer” to “concept developer”.

The survey also gives insights into some characteristics of the development organization. In the past decennia several large development companies in the Netherlands spread their development activities abroad since the opportunities in the Netherlands for new retail developments decreased. Because planning regulations in foreign countries were not as strict as in the Netherlands, and foreign retail markets are not saturated, these development organizations accumulated a lot of experience in realizing innovative new retail concepts abroad. It may be expected that these experiences influence the developers’ opinion about out-of-town retail developments. For that reason, the respondents were asked if their organization also acts in foreign countries as a retail developer. In addition, they were asked in what type of retail developments their organization is specialized: small-scale (re)development projects or large-scale innovative retail projects.

Table 7.2 Sample characteristics developers

| Characteristic | Levels | Frequency | % |
|-----------------------|---------------|------------------|----------|
| <i>Gender</i> | Male | 59 | 88.1 |
| | Female | 8 | 11.9 |
| <i>Age</i> | < 35 years | 24 | 35.8 |
| | 35-44 years | 23 | 34.3 |
| | 45-54 years | 13 | 19.4 |
| | ≥ 55 years | 7 | 10.4 |
| <i>Experience</i> | 0-4 years | 21 | 31.3 |
| | 5-9 years | 11 | 16.4 |
| | 10-14 years | 14 | 20.9 |
| | 15-19 years | 8 | 11.9 |
| | ≥20 years | 13 | 19.4 |

Table 7.3 Specialism by international focus

| | | <i>International focus</i> | | Total |
|-------------------|---|----------------------------|----|-------|
| | | yes | No | |
| <i>Specialism</i> | Small-scale (re) development projects | 4 | 12 | 16 |
| | Large-scale retail development projects | 11 | 5 | 16 |
| | Specialized in both | 15 | 20 | 35 |
| Total | | 30 | 37 | 67 |

As shown in Table 7.3 the organizations in the sample that are specialized in small-scale retail developments are less active abroad than development organizations specialized in large-scale developments. A Chi-square test confirms the significance of this relationship ($\chi^2=6.3$, $df=2$, $sig=0.043$).

Also the relation between the international focus of the developer and the experience was tested. Table 7.4 shows the results. A Chi-square test confirmed the lack of a significant relationship in the sample for these two characteristics ($\chi^2=1.3$, $df=1$, $sig=0.252$).

Table 7.4 Experience by international focus developers

| | | <i>International focus</i> | | Total |
|-------------------|-----------------|----------------------------|----|-------|
| | | yes | No | |
| <i>experience</i> | < 10 years | 12 | 20 | 32 |
| | \geq 10 years | 18 | 17 | 35 |
| Total | | 30 | 37 | 67 |

7.3.2 Retailers

Like the developers, the retailers are largely overrepresented by men (83.3%). This corresponds to the composition of the professional group. The average age of the respondents within the group of retailers is 46 years. Their average experience in the retail sector is 18.5 years with peaks to 40 and 43 years. It can be concluded that the respondents representing the retailers are very experienced. Table 7.5 shows the basic characteristics of the retailers. Out of the 36 respondents the position of 15 respondents was director or owner of a retail company. The remaining respondents hold a position within the organization affiliated to “real estate”, “facilities” or “acquisition”.

Within the retailing industry an important distinction can be made based on the retailer’s business model. On the one hand, the independent retailers can be distinguished and, on the other hand, retailers that utilize some kind of collaboration to increase purchasing power. Collaboration is possible in many ways. A well-known kind of collaboration is franchising where the franchisor grants the retailer the right to use its business model for a percentage of gross monthly sales and a royalty fee.

Table 7.5 Sample characteristics retailers

| Variables | Levels | Frequency | % |
|-------------------|---------------|------------------|----------|
| <i>Gender</i> | Male | 30 | 83.3 |
| | Female | 6 | 16.7 |
| <i>Age</i> | < 35 years | 4 | 11.1 |
| | 35-44 years | 10 | 27.8 |
| | 45-54 years | 14 | 38.9 |
| | ≥ 55 years | 8 | 22.2 |
| <i>Experience</i> | 0-4 years | 3 | 8.3 |
| | 5-9 years | 2 | 5.6 |
| | 10-14 years | 11 | 30.6 |
| | 15-19 years | 4 | 11.1 |
| | ≥20 years | 16 | 44.4 |

Another way of collaboration is buyers jointly purchasing goods to profit from economies of scale (Hondelink, 1993). Since organized retailers in particular are searching for large spaces to exploit their constantly increasing store formats, it may be expected that there will be a relationship between the type of retail organization and size of the shop formats. In the survey, retailers were asked whether they are independent or associated with some kind of retail organization. Moreover, they were asked whether the retail organization represents shop formats that need a surface larger than 1.000 m². Table 7.6 shows these two variables crossed. The independent retailer is well represented in the sample (44.4 %) especially within the categories of large shop formats. The collaborative retail organizations are more evenly distributed across both shop formats. There is no significant relationship between the type of retail organizations and the preferred size of shops according to a Chi-square test ($\chi^2=0.7$, $df=1$, $sig=0.400$).

Table 7.7 shows that there is a broad variety of retail trades represented in the sample.

Table 7.6 Type retail organization by scale shop format (frequencies)

| | | <i>Does organization represent shop formats > 1.000 m²?</i> | | Total |
|---------------------------------|---------------|---|----|-------|
| | | Yes | No | |
| <i>Type retail organization</i> | Collaborative | 11 | 9 | 20 |
| | Independent | 11 | 5 | 16 |
| Total | | 22 | 14 | 36 |

Table 7.7 Retail trades in the sample

| Retail trade | Frequency |
|-----------------------------------|------------------|
| Food | 5 |
| Health and personal care | 2 |
| Department stores | 2 |
| Clothing and clothing accessories | 6 |
| Electronics and appliance | 7 |
| Furniture / home improvement | 7 |
| Restaurants and cafés | 2 |
| Other | 5 |
| Total | 36 |

7.3.3 Local governments

Thirty six percent of the representatives of the local governments in the sample consisted of women. The average age of the respondents is 41 years. Table 7.8 shows the sample characteristics. The positions of the respondents within the local government were mainly policy advisors for economic or spatial affairs.

Table 7.8 Sample characteristics representatives local governments

| Characteristics | Levels | Frequency | % |
|------------------------|---------------|------------------|----------|
| <i>Gender</i> | Male | 43 | 64.2 |
| | Female | 24 | 35.8 |
| <i>Age</i> | < 35 years | 22 | 32.8 |
| | 35-44 years | 20 | 29.9 |
| | 45-54 years | 17 | 25.4 |
| | ≥ 55 years | 8 | 11.9 |

In the survey we did not explicitly ask for the experience of the respondent in retail planning affairs. In the survey the experience of the municipality itself was highlighted. The question was: "Did your municipality deal with decisions concerning a peripheral retail location, different from home and do-it-yourself shops, during the last 15 years?" If this was true, respondents were asked whether they had been involved personally. The results are shown in Table 7.9. Almost half of the respondents in the sample have been involved in out-of-town retail decisions. Only 16 out of 67 municipalities (23.9%) have not been involved in this kind of planning decisions.

Next the relationship between the involvement in retail planning decisions and the size of the municipality is explored. Table 7.10 shows how the different sizes of municipalities are represented in the sample. The spread over the different categories is satisfying taking into account the small number of large municipalities (>250.000 inh.) in the Netherlands.

Table 7.9 Experience municipality with out-of-town retail decisions

| Variable | Levels | Frequency | % |
|-------------------|---|-----------|------|
| <i>Experience</i> | Yes, I was personally involved in these decisions | 32 | 47.8 |
| | Yes, but I was not personally involved | 19 | 28.4 |
| | No | 16 | 23.9 |

Table 7.10 Size municipalities in sample compared to actual number in the Netherlands

| Variable | Levels | Sample | | The Netherlands | |
|--------------------------|-------------------------------|-----------|-------|-----------------|-------|
| | | Frequency | % | Frequency | % |
| <i>Size municipality</i> | < 20.000 inhabitants | 13 | 19.4 | 238 | 54.0 |
| | 20.000 – 50.000 inhabitants | 24 | 35.8 | 136 | 30.8 |
| | 50.000 – 100.000 inhabitants | 17 | 25.4 | 42 | 9.5 |
| | 100.000 – 250.000 inhabitants | 12 | 17.9 | 21 | 4.8 |
| | > 250.000 inhabitants | 1 | 1.5 | 4 | 0.9 |
| Total | | 67 | 100.0 | 441 | 100.0 |

Table 7.11 Involvement by size municipality

| | | <i>Personally involved in out-of-town retail decisions?</i> | | Total |
|--------------------------|----------------------|---|----|-------|
| | | yes | No | |
| <i>Size municipality</i> | < 50.000 inhabitants | 12 | 25 | 37 |
| | ≥ 50.000 inhabitants | 20 | 10 | 30 |
| Total | | 32 | 35 | |

It may be expected that the larger the municipality the more experienced respondents are with out-of-town retail planning decisions. In Table 7.11 these two variables are crossed while the size of the municipality is split into two groups. A Chi-square test confirms this relationship within the sample ($\chi^2=7.8$, $df=1$, $sig=0.005$).

7.4 Conclusion

In this chapter, the data collection procedure and the response was described. The total number of respondents is 170. The number of respondents for developers and the local governments (both 67 respondents) reaches far above the minimum number as aimed for. Also for the group of retailers the number of respondents exceeded the minimum (36), although it is almost the half of the other stakeholder groups. Since all respondents had to complete two times 15 choice tasks, the total number of choices made in the experiment is 5100 which is a good base for the estimation of the choice models.

Especially the group of developers seems to be homogeneous. They were part of a membership list of the Dutch Council of Shopping Centres and, for that reason, ought to be the decision makers within their organizations. This was also reflected in their position within the organization and the average experience (10.8 years). It can also be concluded that the respondents representing the local governments are a good representation of this stakeholder group in the Netherlands. The majority of these respondents were personally invited based on their profession (policy advisors for economic or spatial affairs). Almost half of the respondents

representing a local government were once personally involved in out-of-town retail decisions. The larger municipalities were a bit overrepresented in the sample. However, this seems not to be a problem since it is difficult to find retail planning experts in smaller municipalities (< 20.000 inhabitants). Eventually, three-quarters of the municipalities participating in the experiment have been involved in out-of-town retail decisions (not being home and do-it-your-self facilities). Only the group of retailers seems to be heterogeneous. A broad variety of retail categories are represented in the sample. They also differ in the type of retail organization (dependent or collaborative) and size of the shop formats that they represent. Nevertheless, they share a rich body of experience in the retail sector (18.5 years average).

CHAPTER 8

ANALYSES AND RESULTS

8.1 Introduction

In this chapter the results of the experiment are reported and discussed. It elaborates on the choice models discussed in Chapter 5 and the data that was collected as described in Chapter 6. Before measuring adaptive behaviour we first analyzed the preferences for particular retail plans for each stakeholder group. In order to carry out this analysis a base model was formalized. For each stakeholder group the part-worth utilities for the retail plan attributes were estimated according to this base model. The results provide insight into the preferences for the location of the studied retail categories (Toys & Sporting goods, Home Electronics & Media, Fashion and a Restaurant) at a peripheral location. Both a MNL and Mixed Logit model were estimated. The latter model allows for random parameters reflecting any taste variation in the various attributes. In this study only taste variations were measured only for the main effects.

In the next step, the question to be answered is whether decision makers are inclined to adapt their part-worth utilities for retail plans to the preferred alternatives of other stakeholders in order to seek or move to consensus. For this purpose adaptation variables were added to the base choice models, both the MNL and the ML model. If the preferences of other stakeholders influenced the decision making processes, the models including the adaptation variables should perform better than the base models. Likelihood ratio tests were carried out to test this assumption. In the final step, it was tested whether subsamples within stakeholder groups differ in terms of preferences. As respondents were asked to provide additional information, we were able to consider different subsamples within each stakeholder group. Again the MNL and Mixed

Logit models were estimated and it was expected that these models outperform the base models and de models including the adaptation variables. This was tested using likelihood ratio tests.

This chapter is structured as follows. Section 8.2 first explains the specification of the base model. This section also discusses the preparation of the data. Section 8.3 discusses the procedure for estimating the models. Section 8.4 discusses the results of the base model. In sections 8.5 and 8.6, variables are added to the base model; first adaptation variables and then variables representing sample characteristics. The chapter closes with a conclusion and a discussion of model improvements.

8.2 Base model to measure retail plan preferences

The observed choices from the experiment were first used to estimate a - what we called in this study - “base model”. In addition to the main effects of the retail plan attributes, the base model includes interaction effects and context effects. The structural utility (V) of retail plan alternative i for decision maker DM can be formalized as follows:

$$V_{DM,i} = \sum_k (\beta_{DM,k} + v_{DM,k}) X_{ik} + \sum_{l=1}^L \theta_{DM,l} I_{il} + \sum_k \gamma_{DM,k} Y_{ik} \quad (8.1)$$

where,

$\beta_{DM,k}$ is the parameter indicating the main effect of the k^{th} ($k=0, 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B$) preference variable for decision maker DM ;

$v_{DM,k}$ is the random component indicating the randomness of $\beta_{DM,k}$ with mean 0.0 and standard deviation $\sigma_{DM,k}$;

X_{ik} is the k^{th} preference variable of retail plan i . Note that X_{i0} corresponds with the “both retail plans are not acceptable” option while the other X -variables correspond with the retail plan attributes.

$\theta_{DM,l}$ is the parameter indicating the l^{th} interaction effect ($l=1,2,\dots,L$) for DM ;

I_{il} is the l^{th} interaction variable of retail plan i ;

$\gamma_{DM,k}$ is the parameter indicating the k^{th} context effect for decision maker DM ;

Y_{ik} is the k^{th} context variable of retail plan i . Note that each variable Y_{ik} corresponds with variable X_{ik} .

Interaction effects may play an important role in retail planning choice tasks since the utility for a particular retail plan may increase or decrease when two different attributes (retail categories) are combined at one location. The context effects measure the differences that occur in choice behaviour when changing the context of the choice task in the second part of the experiment. To be able to estimate the models the data collected through the experiment have to be prepared. The first step is to recode the data. In the remainder of this section, the preparation of the dataset for the three types of variables in the base model is explained.

8.2.1 Preparing preference variables

To estimate the base model (Equation 8.1) dummy coding was used to represent the main effects of the attribute levels. The specific coding of the attribute levels is shown in Table 8.1. In the continuation of this study the names of the variables correspond with the coding of the attribute levels. Thus, for example variable X_{1A} stands for *Toys & Sporting Goods* at the location of the sports stadium, X_{1B} represents *Toys & Sporting Goods* at the furniture strip, and so on. Note that each retail plan is characterized by 4 attributes and each attribute consists of three levels. In this study, the dummy variables identify the first and second level of each attribute. Thus, for the C-levels (which are coded as 0, 0), the part-worth utilities are equal to zero, implying that the structural utility of the retail plan with all retail categories in the inner city and no restaurant is equal to zero. This way of coding allows us to compare the part-worth utilities of both peripheral locations with each other and the inner city (which is used as a reference). In total, the parameters for 8 preference variables can be estimated. In addition, a parameter representing the utility of the “none of the alternatives is acceptable” option (β_0) will be estimated.

Table 8.1 Coding of retail plan attributes

| Attributes | | Levels | | Coding | |
|------------|--------------------------|--------|-----------------|--------|---|
| X_1 | Toys and Sporting Goods | A. | Sports stadium | 1 | 0 |
| | | B. | Furniture strip | 0 | 1 |
| | | C. | Inner city | 0 | 0 |
| X_2 | Home Electronics & Media | A. | Sports stadium | 1 | 0 |
| | | B. | Furniture strip | 0 | 1 |
| | | C. | Inner city | 0 | 0 |
| X_3 | Fashion | A. | Sports stadium | 1 | 0 |
| | | B. | Furniture strip | 0 | 1 |
| | | C. | Inner city | 0 | 0 |
| X_4 | Restaurant | A. | Sports stadium | 1 | 0 |
| | | B. | Furniture strip | 0 | 1 |
| | | C. | No restaurant | 0 | 0 |

8.2.2 Introducing interaction variables

The experimental design that was used to generate the retail plans allows for the estimation of interaction effects between the first attribute (*Toys & Sporting goods*), the second attribute (*Home Electronics & Media*) and the fourth attribute (*Restaurant*). An interaction between two attributes will occur if the contribution to the structural utility of joint occurrence of two attribute levels is larger or smaller than the sum of the corresponding main effects. For example, it is imaginable that the preference for a retail plan will increase if both *Toys & Sporting Goods* and *Home Electronics & Media* are at the same location. In total, 12 interaction variables ($I_{i1} \dots I_{i12}$; e.g. $I_{i1} = X_{i1A} \times X_{i2A}$, $I_{i12} = X_{i2B} \times X_{i4B}$) can be specified to measure all measurable first order interaction effects. These form all the possible combinations of attribute levels between the first, second and fourth attribute. Table 8.2 shows how these variables were coded by multiplying the corresponding dummy-coded preference variables for the main effects.

Table 8.2 Coding scheme interaction variables

| Preference variables | | | | | | Interaction variables | | | | | | | | | | | |
|----------------------|----------|----------|----------|----------|----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|-------------------------------|-------------------------------|-------------------------------|
| X_{1A} | X_{1B} | X_{2A} | X_{2B} | X_{4A} | X_{4B} | $I_1=X_{1A} \times X_{2A}$ | $I_2=X_{1A} \times X_{2B}$ | $I_3=X_{1B} \times X_{2A}$ | $I_4=X_{1B} \times X_{2B}$ | $I_5=X_{1A} \times X_{4A}$ | $I_6=X_{1A} \times X_{4B}$ | $I_7=X_{1B} \times X_{4A}$ | $I_8=X_{1B} \times X_{4B}$ | $I_9=X_{2A} \times X_{4A}$ | $I_{10}=X_{2A} \times X_{4B}$ | $I_{11}=X_{2B} \times X_{4A}$ | $I_{12}=X_{2B} \times X_{4B}$ |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8.2.3 Introducing context variables

The experiment was split into two parts. Only in the second part the preferred alternatives of the other stakeholder groups were added to the context of the choice task. The cumulated data of the first and second part of the experiment will be used to extract adaptation variables as will be shown in section 8.4. These adaptation variables measure the degree to which particular stakeholders adjust their personal part-worth utilities given the preferred retail plans of the other stakeholders in each choice set. Adaptation effects in this study are temporary adjustments of personal part-worth utilities in order to move to consensus. However, apart from these adaptation effects, the difference between the first and the second part of the experiment may also trigger the decision makers to adjust their initial part-worth utilities in order to, for example, weaken extreme attitudes towards particular attribute levels. To test these context effects, nine context variables (Y_k) are introduced ($Y_0, Y_{1A}, \dots, Y_{4B}$). These context variables measure the adjustments

in part-worth utilities of stakeholders because information was added to the context of the choice task. The context variables were defined as so called contrast variables. For all choice sets presented in the first part of the experiment (experiment 1, no preference of other stakeholders provided), the context variables are equal to the preference variables, while for the choice sets presented in the second part of the experiment (experiment 2; including preferences of other stakeholders), the context variables are equal to the preference variables multiplied by -1. This principle is shown in Table 8.3. Significant context effects may be interpreted as an a priori adjustment of the decision maker's own part-worth utilities to, or counter to, the average preferences of the other stakeholders as believed by the decision maker for the duration of the decision making process. Of course, context effects can also be estimated for the interaction effects (the θ -parameters). However, in this study we will concentrate on the main effects only.

Table 8.3 Coding dataset for base model

| | Preference variables | Context variables |
|----------------------|----------------------------|---|
| Experiment Part 1 | $X_0, X_{1A} \dots X_{4B}$ | $Y_0, Y_{1A} \dots Y_{4B};$ $Y_k = X_k$ |
| Experiment Part 2 | $X_0, X_{1A} \dots X_{4B}$ | $Y_0, Y_{1A} \dots Y_{4B};$ $Y_k = -X_k$ |

8.3 Estimation procedure

The computer program NLOGIT 4.0 (Greene, 2007) was used to estimate the parameters of the choice model. NLOGIT is an extension of another large, integrated econometrics package, LIMDEP. It includes maximum likelihood estimators for multinomial choice models, such as the MNL model and the mixed logit model. The parameters of the models were estimated in a stepwise manner. After the first run, all variables with a significance $P[|Z|>z]>0.50$ were removed from the model. This criterion was gradually decreased until 0.05. Thus only parameters that are significant at the 5% significance level were included in the models. For each stakeholder group, separate models were estimated.

In this study, both multinomial and mixed logit models are used. The mixed logit model is specified as a random parameter model: for each main effect (each β -parameter), a Normal distribution is assumed. In addition to the mean parameter values (the β_k 's), a standard deviation is estimated as well (the σ_k 's). A relative high standard deviation indicates a high level of variation in the parameter values among respondents, which can be interpreted as a high level of taste variation or heterogeneity. For estimating the mixed logit model, the choice probabilities are calculated by repeatedly applying the multinomial logit. For each subject, random numbers are drawn for the random parameters and individual choice probabilities are calculated. During one simulation run, the same random values are utilized for all choice sets presented to one respondent. For a good performance, very large numbers of draws are required. However, instead of a large number of random draws, a Halton sequence of draws was used (Bhat, 2001). Halton draws give a fairly even coverage over the domain of the distributions and the draws for one observation tend to fill in the spaces that were left empty by the previous observations. A Halton sequence of draws with only one tenth the number of random draws is often equally effective. In this study the number of Halton draws was set to 1.000, which can be considered as a relatively high number.

8.4 Model estimation preferences stakeholders

In this section the results of the estimation of the base model are discussed. Table 8.4, 8.5 and 8.6 show for each stakeholder group the results of both the MNL and the ML model where the main effects, the interaction effects and the context effects are included. For all three models the Rho^2 adjusted for the MNL model is satisfying as indicated by values of 0.27 for the developers' model and 0.32 for the local governments' model, although the value of the retailers' model is considerably lower (0.15). Reasons may be a high degree of heterogeneity among the retailer-respondents. This is reflected in the ML model of the retailers that shows, compared to the other stakeholder groups, relative high levels of heterogeneity. As we look at the adjusted Rho^2 of the ML model we see for all three stakeholders that the goodness-of-fit increased considerably compared to the MNL model. Also likelihood ratio tests confirmed that the ML models perform significantly better. It is obvious that the differences between the values for the adjusted Rho^2 of the three stakeholders' models is smaller for the ML models compared to the MNL models, implying that especially for the retailers estimating for heterogeneity improves model performance. In the following, the parameters of the 'base model' (Equation 8.1) are discussed separately.

8.4.1 Main effects

When analyzing the results of the MNL model it is immediately obvious that for all three stakeholder groups the part-worth utilities for the location of *Fashion* at a peripheral location is significantly negative. The values of the parameters for the variables X_{3A} (*Fashion* near Sport Stadium) and X_{3B} (*Fashion* at Furniture Strip) are by far the lowest. Also for none of the stakeholder groups the utility for the location of *Home Electronics & Media* near the sport stadium (X_{2A}) shows positive values, implicating that for this retail category a sport stadium seems not to be a suitable location compared to the inner city. Only developers attach a positive utility to this retail category if it is located at the other peripheral location: the furniture strip ($X_{2B}=0.243$), implicating that they find the furniture strip the most suitable location for *Home Electronics & Media* compared to the other two locations. It would be expected that adding *Toys & Sporting Goods* near a sport stadium should show higher utility values, because the similarity

Table 8.4 Estimated parameters developers (including preference, interaction and context variables)

| | Developers | | | | | |
|-----------------------------------|------------|----------|----------|----------|----------|----------|
| | MNL | | ML | | | |
| Preference variables | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 None acceptable alternative | -0.706 | 0.000 | -1.004 | 0.000 | 1.596 | 0.000 |
| X_{1A} Toys & Sports SS | - | - | 0.000 | - | 0.544 | 0.000 |
| X_{2A} Electr. & Media SS | -0.655 | 0.000 | -1.228 | 0.000 | 1.144 | 0.000 |
| X_{2B} Electr. & Media FS | 0.243 | 0.016 | 0.000 | - | 1.061 | 0.001 |
| X_{3A} Fashion SS | -2.680 | 0.000 | -5.304 | 0.000 | 2.876 | 0.002 |
| X_{3B} Fashion FS | -2.237 | 0.000 | -3.531 | 0.000 | 2.010 | 0.003 |
| X_{4A} Restaurant SS | - | - | 0.000 | - | 0.675 | 0.004 |
| X_{4B} Restaurant FS | 0.206 | 0.026 | 0.353 | 0.004 | - | - |
| Interaction variables | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1 = X_{1A} \times X_{2A}$ | 0.524 | 0.001 | 0.859 | 0.000 | | |
| $I_5 = X_{1A} \times X_{4A}$ | 0.624 | 0.000 | 0.886 | 0.000 | | |
| Context variables | γ | P(Z >z) | γ | P(Z >z) | | |
| Y_{1A} Toys & Sports SS | 0.199 | 0.019 | 0.266 | 0.013 | | |
| Y_{2A} Electr. & Media SS | -0.167 | 0.048 | -0.304 | 0.005 | | |
| Y_{3A} Fashion SS | -0.231 | 0.026 | -0.434 | 0.002 | | |
| Y_{3B} Fashion FS | -0.311 | 0.001 | -0.394 | 0.001 | | |
| $LL(\beta)$ | -1615.8 | | -1320.3 | | | |
| $LL(0)$ | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | 0.27 | | 0.40 | | | |

between branch and target group may generate some synergy effect. However, this variable is not significant for any stakeholder group. Thus, the stakeholders do not prefer *Toys & Sporting Goods* near a sport stadium over *Toys & Sporting Goods* in the city centre. Adding a *Restaurant* to one of the peripheral locations shows a significant value in only one case. Only the developers attach a significant positive value to adding a *Restaurant* at the furniture strip (0.206). The part-worth utility of the “none of the alternatives is acceptable” option is negative and significant for all three stakeholder groups (resp. -0.706, -0.581 and -0.993 for the MNL model). This implies that in most cases, respondents tend to choose one of the retail plans.

Table 8.5 Estimated parameters retailers (including preference, interaction and context variables)

| | Retailers | | | | | |
|-----------------------------------|-----------|----------|----------|----------|----------|----------|
| | MNL | | ML | | | |
| Preference variables | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 None acceptable alternative | -0.581 | 0.000 | 0.000 | - | 2.161 | 0.000 |
| X_{1A} Toys & Sports SS | - | - | 0.000 | - | 0.885 | 0.009 |
| X_{2A} Electr. & Media SS | -1.019 | 0.000 | -1.493 | 0.003 | 2.636 | 0.000 |
| X_{2B} Electr. & Media FS | - | - | 0.000 | - | 1.703 | 0.001 |
| X_{3A} Fashion SS | -1.654 | 0.000 | -2.853 | 0.000 | 3.554 | 0.002 |
| X_{3B} Fashion FS | -1.528 | 0.000 | -3.220 | 0.000 | 4.147 | 0.003 |
| Interaction variables | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1 = X_{1A} \times X_{2A}$ | 0.786 | 0.000 | 0.954 | 0.003 | | |
| $I_6 = X_{1A} \times X_{4B}$ | 0.511 | 0.002 | 0.797 | 0.002 | | |
| $I_7 = X_{1B} \times X_{4A}$ | 0.495 | 0.003 | 0.567 | 0.016 | | |
| $LL(\beta)$ | -1009.8 | | -750.5 | | | |
| $LL(0)$ | -1186.5 | | -1186.5 | | | |
| $Rho^2_{Adjusted}$ | 0.15 | | 0.37 | | | |

The ML models include random parameters for the preference variables. In general we see the same pattern as with the MNL models. However, there are some high estimated standard deviations that should be discussed here. Especially the variables for the location of *Fashion* at a peripheral location (X_{3A} and X_{3B}) show high taste differentiation for all three stakeholder groups. Nevertheless, the majority of the developers and local governments still do not prefer locating *Fashion* at one of the peripheral locations. The value of the standard deviations for the retailers regarding these particular variables are quite high (3.554 and 4.147) implicating that quite some retailers prefer *Fashion* to be located at a peripheral location. We also recognize this pattern for the location of *Home Electronics & Media* at the sport stadium (X_{2A}). For both the MNL and the ML model the part-worth utility for the location of *Home Electronics & Media* at the sport stadium for all three stakeholder groups show negative values. The high variance for all three stakeholder groups suggests heterogeneity among the subsamples. Especially for the group of

Table 8.6 Estimated parameters local governments (including preference, interaction and context variables)

| | Local governments | | | | | |
|-----------------------------------|-------------------|----------|----------|----------|----------|----------|
| | MNL | | ML | | | |
| Preference variables | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 None acceptable alternative | -0.993 | 0.000 | -0.969 | 0.000 | 1.802 | 0.000 |
| X_{1A} Toys & Sports SS | - | - | 0.000 | - | 1.043 | 0.000 |
| X_{1B} Toys & Sports FS | -0.584 | 0.000 | -0.689 | 0.000 | 0.739 | 0.000 |
| X_{2A} Electr. & Media SS | -1.123 | 0.000 | -1.450 | 0.000 | 0.757 | 0.006 |
| X_{2B} Electr. & Media FS | - | - | 0.000 | - | 1.267 | 0.000 |
| X_{3A} Fashion SS | -2.889 | 0.000 | -5.436 | 0.000 | 2.870 | 0.000 |
| X_{3B} Fashion FS | -2.438 | 0.000 | -4.263 | 0.000 | 3.393 | 0.000 |
| X_{4A} Restaurant SS | - | - | 0.000 | - | 0.622 | 0.003 |
| Interaction variables | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_3=X_{1B} \times X_{2A}$ | 0.545 | 0.011 | - | - | | |
| $I_6=X_{1A} \times X_{4B}$ | 0.660 | 0.000 | 0.693 | 0.000 | | |
| $LL(\beta)$ | -1495.5 | | -1174.4 | | | |
| $LL(0)$ | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | 0.32 | | 0.47 | | | |

retailers we see that due to the high standard deviation ($\sigma = 2.636$) some of the retailers do prefer *Home Electronics & Media* to be located at the sport stadium.

For some attributes (e.g. *Toys & Sporting Goods* at the sport stadium (X_{1A}) and *Home Electronics & Media* at the furniture strip (X_{2B})), the standard deviation is significantly different from zero, while the corresponding mean value is not. This suggests that preferences regarding these variables fluctuate around zero, cancelling out to neutral mean values. Finally, the “none of these alternatives is acceptable”-option shows a high variance for all three stakeholder groups (especially for the retailers) implicating that although the mean value was negative for developers and planners, and zero for retailers, some respondents tend to attach a positive utility to the “none of the alternatives is acceptable”- option.

8.4.2 Interaction effects

Out of twelve possible interaction effects, for each stakeholder group, only a few interaction effects appeared to be significant. For developers two interaction effects play a role: $I_1 = X_{1A} \times X_{2A}$ (both *Toys & Sporting Goods* and *Home Electronics & Media* near the sport stadium) and $I_5 = X_{1A} \times X_{4A}$ (both *Toys & Sporting Goods* and a *Restaurant* near the sport stadium). Both interaction effects are positive, implying that if the corresponding variables are equal to unity, the utility of the retail plan will increase. Although the main effects of the variables X_{1A} and X_{4A} are not significantly different from zero, both variables affect the utility of an alternative retail plan by means of their mutual interaction or, in case of X_{1A} , in interaction with X_{2A} . Thus, developers believe that the joint location of some retail categories near the sport stadium will increase the utility of a retail plan, not when they occur in isolation. If we look at the results of the MNL model we see that for developers *Home Electronics & Media* near the sport stadium generates a negative utility ($X_{2A} = -0.655$). However, if *Toys & Sporting Goods* (X_{1A}) and a *Restaurant* (X_{4A}) are realized at this location as well, the utility of this retail plan will increase with respectively $0.524 + 0.624$. Thus, locating *Toys & Sporting Goods*, *Home Electronics & Media* and a *Restaurant* near the sport stadium will yield a positive utility ($-0.655 + 0.524 + 0.624 = 0.493$) for developers. This principle also holds for the retailers. Retailers do not prefer *Home Electronics & Media* to be located near the sport stadium ($X_{2A} = -1.019$ in the MNL model). However, if *Toys & Sporting Goods* (X_{1A}) are added to this location as well, the utility will increase with 0.786 according to the MNL model. For both stakeholder groups (developers and retailers) the ML-model shows a similar pattern as the MNL-model.

The utility for retailers regarding the location of *Toys & Sporting Goods* and the *Restaurant* at a peripheral location (X_{1A} , X_{1B} , X_{4A} , X_{4B}) are not significantly different from zero. However, when these retail categories are allocated in different peripheral locations, the utility increases for both models as indicated by the interaction effects ($I_6 = X_{1A} \times X_{4B}$ and $I_7 = X_{1B} \times X_{4A}$). Something similar holds for the local governments: they tend to believe that the location of *Toys & Sporting Goods* at the furniture strip ($X_{1B} = -0.584$ according to the MNL model) or *Home Electronic & Media* at the sport stadium ($X_{2A} = -1.123$ for the MNL model) is not preferable. But if both these variables appear in the same retail plan, the resulting utility will increase with 0.545 . Note that this interaction effect ($I_3 = X_{1B} \times X_{2A}$) only appears in the MNL model. Finally, for the

local governments the interaction effect $I_6=X_{1A} \times X_{4B}$ appears to be significant in both models. This implies that although for local governments the utility attached to a *Restaurant* at the furniture strip neither to *Toys and Sporting Goods* near the sport stadium do not significantly differ from zero, a combination of these two characteristics in one retail plan has a positive value ($X_{1A} \times X_{4B}=0.660$ in the MNL model and 0.693 in the ML model).

8.4.3 Context effects

The context variables serve to test differences in choice behaviour between the two parts of the experiment. In the first part of the experiment, the context variables are defined as the main variables X_0, \dots, X_{4B} multiplied by +1, and in the second part of the experiment as X_0, \dots, X_{4B} multiplied by -1. Thus, a positive context effect means that the decision maker decreases his part-worth utility of the corresponding attribute level if information regarding other stakeholders' choices is provided (part 2 of the experiment). Context effects measure only the effects of presenting the other stakeholders' preferred alternatives. When analyzing the results we see that this change of preference only occurred among the group of developers. The MNL model and the ML model show the same pattern for the type of context variables and the direction of the values. For four variables the models show some small differences in choice behaviour due to the changes in choice context. Except for one (Y_{1A}) the values of the effects are negative, indicating that developers tend to weaken their aversion for *Home Electronics & Media* near the sport stadium and *Fashion* at both peripheral locations when information is provided about the choices of other stakeholders in the second part of the experiment. For example, the part-worth utility for *Fashion* near the sport stadium is -2.680 for the MNL model. According to the context effects ($Y_{3A}=-0.231$), the part-worth utility for *Fashion* near the sport stadium in the first part of the experiment is equal to $-2.680-0.231=-2.911$, while in the second part of the experiment this is equal to $-2.680+0.231=-2.449$. This may indicate that, except for *Toys & Sporting Goods* near the sport stadium, developers seek for consensus if other stakeholders are involved.

8.5 Model estimations including adaptive behaviour

In order to estimate adaptive behaviour additional variables have to be defined according to Equation 5.10 in chapter 5. The equation for the structural utility of the base model (Equation 8.1) now becomes:

$$\begin{aligned}
 V_{DM,i} = & \sum_k (\beta_{DM,k} + v_{DM,k}) X_{ik} + \sum_{l=1}^L \theta_{DM,k} I_{il} + \sum_k \gamma_{DM,k} Y_{ik} \\
 & + \sum_k \alpha_{DM,k}^{S1} A_{ik}^{S1} + \sum_k \alpha_{DM,k}^{S2} A_{ik}^{S2} + \sum_k \alpha_{DM,k}^{S1 \times S2} A_{ik}^{S1 \times S2}
 \end{aligned} \tag{8.2}$$

where the $\alpha_{DM,k}$ -parameters measure the adaptation effects for each attribute level for decision maker DM . Then, A_{ik}^{S1} is the k^{th} adaptation variable to the first stakeholder (SI) of retail plan i , and so on. A_{i0}^{S1} refers to the effect regarding the utility of the “None of the alternatives is acceptable”-option. The last right-hand side component measures the additional adaptation effect if both stakeholders prefer the same alternative in the choice set. Note that positive α -parameters indicate that the decision maker is willing to adhere to the other stakeholders. Negative α -parameters suggest that the decision maker does not want to adhere to the other stakeholders. Also, a decision maker may want to adhere to one stakeholder (positive α -parameters for that stakeholder), but not to the other stakeholder (negative α -parameters for the other stakeholder). For each stakeholder nine ($k=0, 1A, \dots, 4B$) adaptation effects can be estimated according to the variables of each retail plan alternative (including the “none of the alternatives is acceptable option”).

Tables 8.7, 8.8 and 8.9 show the estimated parameters of the models including adaptation effects. Only the significant parameters are included in the models. Obviously, the number of significant adaptation variables is largest for the developers and smallest for the retailers. It may be concluded that retailers appear to be the most persistent decision makers. However, another reason may be the relative small number of respondents in this group, as smaller sample sizes may generate less significant parameters. All adaption effects are positive, except for one in the

developers' model, implying that stakeholders will tag on the opinion of the other stakeholder for all these significant attribute levels.

In general, there are some small differences in the type and number of adaptation variables that appear to be significant when comparing the MNL and ML model of the developers and the local governments. A reason may be that the ML-model is more sensitive than the MNL-model. We also see that the number of context variables has become smaller for developers, especially in the MNL model, due to the inclusion of adaptation variables. The adaptation variables appear to explain the context effects partially.

As we take a closer look at the adaptive behaviour of the developers we see that they adapt their preference to the retailers for almost all retail plan attributes except for adding a *Restaurant* at a peripheral location and adding *Toys & Sports* to the sport stadium (and *Fashion* near the sport stadium according to ML and *Toys & Sports* to the furniture strip according to MNL). All significant adaptation effects are positive, implying that the corresponding utilities will increase. For example, the part-worth utility of the developer for adding *Home Electronics & Media* to the furniture strip (X_{2B}) amounts to 0.284 in the MNL model. According to the corresponding adaptation parameter for the retailers ($A_{2B}^{Ret}=0.413$), the developer is willing to increase his/her part-worth utility if the retailers prefers the alternative. Thus, if the developer knows that the retailer prefers a retail plan with *Home Electronics & Media* at the furniture strip, the developer will become more in favour of locating *Home Electronics & Media* at the furniture strip ($0.284+0.413=0.697$). For *Home Electronics & Media* near the sport stadium the part-worth utility of the developers is negative in both the MNL and the ML model (resp. $X_{2A}=-0.788$ and -1.204). But, if the developer knows that the retailer prefers a retail plan with *Home Electronics & Media* at the sport stadium, the developer will increase his part-worth utility (resp. $A_{2A}^{Ret}=0.353$ and 0.487) to a less negative value (resp. $-0.788+0.353=-0.435$ and $-1.204+0.487=-0.717$). Similar effects occur regarding *Fashion* at a peripheral location.

Compared to the other adaptation effects, the adaptation effects for *Fashion* at the furniture strip are relatively strong according to the ML model ($A_{3B}^{Ret}=1.390$ and $A_{3B}^{Lgv}=1.233$). However, if both retailers and local governments prefer the same retail plan with *Fashion* at the furniture strip, the developers are not willing to cumulate both adaptation effects, indicated by the significant negative parameter for $A^{Ret \times Lgv}_{3B}$ (-1.674). Finally, if one or both other stakeholders prefer none of the retail plans in the choice set, the developers increase their utility for this “none

of the alternatives is acceptable” option (A^{Ret}_0 and A^{Lgv}_0). We can conclude that, in general, developers (whether developers have a positive or negative attitude towards the location of particular retail facilities at peripheral locations) are sensitive to the preferences of the retailers and the local governments.

Retailers are the most persistent in their viewpoints. They are not very sensitive to the other stakeholder’s choices. Only two adaptation variables appear to be significant in both the MNL and the ML model. Although the part-worth utility for retailers concerning the location of a *Restaurant* at the furniture strip (X_{4B}) did not significantly differ from zero, influenced by the developers’ opinion the retailer will add some utility ($A^{\text{Dev}}_{4B}=0.575$ in the MNL model and 0.722 in the ML model) to this retail plan characteristic. The retailers’ part-worth utility of adding *Home Electronics & Media* to the sport stadium is negative ($X_{2A}=-1.213$ in the MNL model and -2.540 in the ML model). However, the ML model also shows a high standard deviation for this variable ($\sigma =2.684$), implying there is much taste variation among retailers. Influenced by the opinion of the local governments, the utility that retailers attach to this variable will increase with ($A^{\text{Lgv}}_{2A}=$) 0.628. Taking into account the heterogeneity on this topic, more retailers will become in favour of adding this branch to the sport stadium.

The local governments show a limited tendency to adapt their part-worth utilities to the developers’ choices. There is some evidence that they adapt their part-worth utility of locating *Home Electronics & Media* at a peripheral location to the preference of the developer (A^{Dev}_{2A} in the MNL model and A^{Dev}_{2B} in the ML model) although they still will be against these alternatives (the part-worth utilities stay negative). Retailers will affect the part-worth utilities of local governments for locating *Fashion* near the sport stadium and adding a *Restaurant* to the furniture strip. For *Fashion* near the sport stadium, the mean utility remains substantially negative. In the case of a *Restaurant* at the furniture strip, the utility will become positive. Compared with the developers and the retailers, the local planners are more likely to adjust their utilities if both other stakeholders prefer the same alternative in the choice set. Three such effects are significant. One of these effects concerns the adaptive behaviour of the local governments for locating *Toys & Sporting Goods* at the furniture strip. The main effects show that the part-worth utility for this variable (X_{1B}) is negative for both models (resp. -0.570 and -0.473), implying that the local governments do not prefer this retail category to be located at the furniture strip. However, since the adaptation parameter for $A^{\text{Dev} \times \text{Ret}}_{1B}$ has a rather high positive value (resp. 0.851 and 0.770) the

Table 8.7 Estimated parameters developers (including interaction, context and adaptation variables)

| | | Developers | | | | | |
|----------------------------|-----------------------------|------------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -0.663 | 0.000 | -1.182 | 0.000 | 1.990 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 0.547 | 0.001 |
| X_{1B} | Toys & Sports FS | - | - | 0.000 | - | 0.619 | 0.001 |
| X_{2A} | Electr. & Media SS | -0.788 | 0.000 | -1.204 | 0.000 | 1.220 | 0.000 |
| X_{2B} | Electr. & Media FS | 0.284 | 0.006 | 0.548 | 0.006 | 1.093 | 0.000 |
| X_{3A} | Fashion SS | -2.784 | 0.000 | -5.143 | 0.000 | 3.181 | 0.000 |
| X_{3B} | Fashion FS | -2.335 | 0.000 | -4.037 | 0.000 | 2.906 | 0.000 |
| X_{4B} | Restaurant FS | 0.305 | 0.002 | 0.444 | 0.001 | - | - |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1=X_{1A} \times X_{2A}$ | | 0.650 | 0.000 | 1.054 | 0.000 | | |
| $I_5=X_{1A} \times X_{4A}$ | | 0.593 | 0.000 | 0.978 | 0.000 | | |
| $I_9=X_{2A} \times X_{4A}$ | | 0.379 | 0.035 | 0.508 | 0.030 | | |
| Context variables | | γ | P(Z >z) | γ | P(Z >z) | | |
| Y_{2A} | Electr. & Media SS | -0.185 | 0.028 | -0.268 | 0.019 | | |
| Y_{3A} | Fashion SS | - | - | -0.425 | 0.004 | | |
| Y_{3B} | Fashion FS | - | - | -0.431 | 0.002 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_0^{Ret} | Both not acceptable | 0.306 | 0.000 | 0.461 | 0.000 | | |
| A_{1B}^{Ret} | Toys & Sports FS | 0.315 | 0.026 | - | - | | |
| A_{2A}^{Ret} | Electr. & Media SS | 0.353 | 0.009 | 0.487 | 0.006 | | |
| A_{2B}^{Ret} | Electr. & Media FS | 0.413 | 0.002 | 0.626 | 0.000 | | |
| A_{3A}^{Ret} | Fashion SS | - | - | 0.633 | 0.005 | | |
| A_{3B}^{Ret} | Fashion FS | 0.438 | 0.003 | 1.390 | 0.000 | | |
| A_0^{Lgv} | Both not acceptable | 0.291 | 0.000 | 0.333 | 0.003 | | |
| A_{2A}^{Lgv} | Electr. & Media SS | 0.309 | 0.021 | 0.510 | 0.004 | | |
| A_{2B}^{Lgv} | Electr. & Media FS | - | - | 0.470 | 0.008 | | |
| A_{3B}^{Lgv} | Fashion FS | 0.295 | 0.038 | 1.233 | 0.001 | | |
| $A_{3B}^{Ret \times Lgv}$ | Fashion FS | - | - | -1.674 | 0.026 | | |
| $LL(\beta)$ | | -1552.8 | | -1220.2 | | | |
| $LL(0)$ | | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | | 0.29 | | 0.44 | | | |

Table 8.8 Estimated parameters retailers (including interaction, context and adaptation variables)

| | | Retailers | | | | | |
|----------------------------|-----------------------------|-----------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -0.630 | 0.000 | -1.359 | 0.000 | 1.944 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 0.958 | 0.000 |
| X_{2A} | Electr. & Media SS | -1.213 | 0.000 | -2.540 | 0.000 | 2.684 | 0.000 |
| X_{2B} | Electr. & Media FS | - | - | 0.000 | - | 2.647 | 0.000 |
| X_{3A} | Fashion SS | -1.724 | 0.000 | -2.950 | 0.000 | 4.289 | 0.000 |
| X_{3B} | Fashion FS | -1.569 | 0.000 | -2.442 | 0.001 | 3.375 | 0.000 |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1=X_{1A} \times X_{2A}$ | | 0.893 | 0.000 | 1.167 | 0.001 | | |
| $I_6=X_{1A} \times X_{4B}$ | | 0.585 | 0.000 | 0.923 | 0.001 | | |
| $I_7=X_{1B} \times X_{4A}$ | | 0.364 | 0.044 | - | - | | |
| $I_9=X_{2A} \times X_{4A}$ | | 0.580 | 0.011 | 0.970 | 0.001 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_{4B}^{Dev} | Restaurant FS | 0.575 | 0.000 | 0.772 | 0.000 | | |
| A_{2A}^{Lgv} | Electr. & Media SS | 0.442 | 0.016 | 0.628 | 0.011 | | |
| $LL(\beta)$ | | -996.0 | | -728.0 | | | |
| $LL(0)$ | | -1186.5 | | -1186.5 | | | |
| $Rho^2_{Adjusted}$ | | 0.16 | | 0.38 | | | |

preference of local governments turns positive (e.g. $-0.473+0.770=0.297$ in the ML model) if the decision maker of the local government knows that both the developer and the retailer are in favour of placing *Toys & Sporting Goods* at the furniture strip. Other such adaptations occur if both the developer and the retailer choose the “none of the alternatives is acceptable” option ($A^{Dev \times Ret}_0$), although the mean utilities remain negative, and if they both choose the plan with the *Restaurant* near the sport stadium (according to the ML model). In general we can conclude that adding adaptation variables to the models increases the goodness-of-fit of the models. The $Rho^2_{Adjusted}$ for both type of models (MNL and ML) increased.

Table 8.9 Estimated parameters local governments (including interaction, context and adaptation variables)

| | | Local governments | | | | | |
|----------------------------|-----------------------------|-------------------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -1.007 | 0.000 | -1.140 | 0.000 | 2.032 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 1.157 | 0.000 |
| X_{1B} | Toys & Sports FS | -0.570 | 0.000 | -0.473 | 0.011 | - | - |
| X_{2A} | Electr. & Media SS | -1.091 | 0.000 | -1.582 | 0.000 | 0.567 | 0.047 |
| X_{3A} | Fashion SS | -2.950 | 0.000 | -5.935 | 0.000 | 2.768 | 0.000 |
| X_{3B} | Fashion FS | -2.491 | 0.000 | -4.942 | 0.000 | 3.987 | 0.000 |
| X_{4A} | Restaurant SS | - | - | 0.512 | 0.009 | 0.952 | 0.000 |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_3=X_{1B} \times X_{2A}$ | | 0.570 | 0.009 | 0.822 | 0.009 | | |
| $I_6=X_{1A} \times X_{4B}$ | | 0.739 | 0.000 | 1.033 | 0.000 | | |
| $I_7=X_{1B} \times X_{4A}$ | | - | - | -1.017 | 0.001 | | |
| $I_9=X_{2A} \times X_{4A}$ | | - | - | -0.380 | 0.049 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_{2A}^{Dev} | Electr. & Media SS | 0.333 | 0.023 | - | - | | |
| A_{2B}^{Dev} | Electr. & Media FS | - | - | 0.394 | 0.023 | | |
| A_{3A}^{Ret} | Fashion SS | 0.596 | 0.003 | 0.968 | 0.000 | | |
| A_{4B}^{Ret} | Restaurant FS | 0.551 | 0.000 | 0.994 | 0.000 | | |
| $A_0^{Dev \times Ret}$ | Both not acceptable | 0.459 | 0.001 | 0.938 | 0.000 | | |
| $A_{1B}^{Dev \times Ret}$ | Toys & Sports FS | 0.851 | 0.002 | 0.770 | 0.039 | | |
| $A_{4A}^{Dev \times Ret}$ | Restaurant SS | - | - | 1.161 | 0.001 | | |
| $LL(\beta)$ | | -1453.0 | | -1107.7 | | | |
| $LL(0)$ | | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | | 0.34 | | 0.50 | | | |

8.6 Model estimations including differences within each group of stakeholders

In the former analysis, the ML model already tested for heterogeneity within each sample of stakeholders. A more straightforward way to account for heterogeneity is estimating interaction effects between respondent characteristics and variables describing the choice alternatives. Since we asked in the online-questionnaire for respondents characteristics we are able to include these differences in respondent characteristics into the model. For this purpose, Equation 8.2 for the structural utility can be extended by adding variables that measure the differences between subsamples. The resulting utility function can then be expressed as:

$$\begin{aligned}
 V_{DM,i} = & \sum_k (\beta_{DM,k} + v_{DM,k}) X_{ik} + \sum_{l=1}^L \theta_{DM,k} I_{il} + \sum_k \gamma_{DM,k} Y_{ik} \\
 & + \sum_k \alpha_{DM,k}^{S1} A_{ik}^{S1} + \sum_k \alpha_{DM,k}^{S2} A_{ik}^{S2} + \sum_k \alpha_{DM,k}^{S1 \times S2} A_{ik}^{S1 \times S2} \\
 & + \sum_k \delta_{DM,k}^{Sample} X_{ik} + \sum_{l=1}^L \delta_{DM,k}^{Sample} I_{il} + \sum_k \delta_{DM,k}^{Sample} Y_{ik} \\
 & + \sum_k \delta_{DM,k}^{S1} A_{ik}^{S1} + \sum_k \delta_{DM,k}^{S2} A_{ik}^{S2} + \sum_k \delta_{DM,k}^{S1 \times S2} A_{ik}^{S1 \times S2}
 \end{aligned} \tag{8.3}$$

where we added the δ -parameters and “*Sample*”-variables ($^{Sample}X$, $^{Sample}I$, $^{Sample}Y$ and $^{Sample}A$) to measure the differences in subsamples. Because these differences can occur for all variables introduced before, in theory we can estimate 57 additional parameters per subsample characteristic: 9 preference variables, 12 interaction variables, 9 context variables and 27 adaptation variables). For example, $^{Sample}X_{ik}$ represents the sample variable corresponding with the k^{th} preference variable of retail plan i . Of course, not all these parameters will be significant. Depending on the characteristics of the respondents we can distinguish several subsamples resulting in several sets of sample variables. As already discussed in Chapter 7, some of these characteristics are correlated. In that case, it is not wise to include these sample characteristics simultaneously into the model. Especially among the local governments sample characteristics were correlated as will be shown in section 8.6.3.

To estimate differences between two subsamples each stakeholder group was split into two subsamples based on the most important characteristics. Contrast variables were added to the data set. The contrast variables for the first part of the sample were copied from their corresponding variables. For the second part, these variables were multiplied by -1. Only significant contrast variables were selected by a stepwise model estimation procedure. We repeated this procedure of selecting significant contrast variables for each subsample we could create given the respondents' characteristics.

8.6.1 Model estimations including subsamples developers

Within the total sample of 67 developers we could distinguish several subsamples based on the characteristics of the respondents. In order to get enough respondents within each subsample only subsamples were made based on characteristics that resulted in approximately equally sized subsamples. For the group of developers we created subsamples based on the characteristics "experience" and "international focus". Concerning "experience" the developers can be split in a group with less than 10 years of experience and a group with at least 10 years of experience. For "international focus" we distinguished developers that also act as a retail developer abroad and those who do not.

The results of estimating the MNL and ML models are reported in Table 8.10. A likelihood ratio test confirms that the ML model including sample variables performs significantly better than the model without sample variables, although the value for $Rho^2_{Adjusted}$ is the same. The results of the likelihood ratio tests are discussed in section 8.7. Regarding the MNL model, one of the context effects is replaced by a subgroup dependent context effect. The performance of the MNL remains virtually unchanged. In both models presented in Table 8.10, only one contrast parameter appeared to be significant: $^{Exp}Y_{1B}$ (value: -0.216 resp. -0.390). Across all developers in the sample, the main effect as well as the context effect regarding *Toys & Sporting Goods* at the furniture strip are not different from zero. However, the two subsamples differ. For the group of developers with at least 10 years of experience the context effects become positive. A positive context effect means that the part-worth utility of *Toys & Sporting Goods* at the furniture strip will decrease if the preferences of the other stakeholders are reported in the choice tasks.

Table 8.10 Estimated parameters developers (including interaction, context, adaptation and sample variables)

| | | Developers | | | | | |
|-------------------------------|-----------------------------|------------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -0.658 | 0.000 | -1.159 | 0.000 | 2.040 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 0.545 | 0.001 |
| X_{1B} | Toys & Sports FS | - | - | 0.000 | - | 0.654 | 0.001 |
| X_{2A} | Electr. & Media SS | -0.771 | 0.000 | -1.217 | 0.000 | 1.199 | 0.000 |
| X_{2B} | Electr. & Media FS | 0.343 | 0.001 | 0.583 | 0.003 | 1.143 | 0.000 |
| X_{3A} | Fashion SS | -2.802 | 0.000 | -5.146 | 0.000 | 3.217 | 0.000 |
| X_{3B} | Fashion FS | -2.374 | 0.000 | -4.046 | 0.000 | 2.931 | 0.000 |
| X_{4B} | Restaurant FS | 0.301 | 0.002 | 0.462 | 0.000 | - | - |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1=X_{1A} \times X_{2A}$ | | 0.648 | 0.000 | 1.045 | 0.000 | | |
| $I_5=X_{1A} \times X_{4A}$ | | 0.599 | 0.000 | 1.001 | 0.000 | | |
| $I_9=X_{2A} \times X_{4A}$ | | 0.385 | 0.032 | 0.529 | 0.025 | | |
| Context variables | | γ | P(Z >z) | γ | P(Z >z) | | |
| Y_{2A} | Electr. & Media SS | - | - | -0.275 | 0.016 | | |
| Y_{3A} | Fashion SS | - | - | -0.407 | 0.006 | | |
| Y_{3B} | Fashion FS | - | - | -0.408 | 0.003 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_0^{Ret} | Both not acceptable | 0.314 | 0.000 | 0.479 | 0.000 | | |
| A_{1B}^{Ret} | Toys & Sports FS | 0.295 | 0.038 | - | - | | |
| A_{2A}^{Ret} | Electr. & Media SS | 0.369 | 0.006 | 0.489 | 0.006 | | |
| A_{2B}^{Ret} | Electr. & Media FS | 0.435 | 0.003 | 0.628 | 0.000 | | |
| A_{3A}^{Ret} | Fashion SS | - | - | 0.621 | 0.006 | | |
| A_{3B}^{Ret} | Fashion FS | 0.435 | 0.003 | 1.408 | 0.000 | | |
| A_0^{Lgv} | Both not acceptable | 0.285 | 0.000 | 0.362 | 0.002 | | |
| A_{2A}^{Lgv} | Electr. & Media SS | 0.349 | 0.008 | 0.491 | 0.006 | | |
| A_{2B}^{Lgv} | Electr. & Media FS | 0.296 | 0.019 | 0.477 | 0.007 | | |
| A_{3B}^{Lgv} | Fashion FS | - | - | 1.247 | 0.001 | | |
| $A_{3B}^{Ret \times Lgv}$ | Fashion FS | - | - | -1.706 | 0.025 | | |
| Sample variables ¹ | | δ | P(Z >z) | δ | P(Z >z) | | |
| Y_{1B}^{Exp} | Toys & Sports FS | -0.216 | 0.007 | -0.390 | 0.000 | | |
| $LL(\beta)$ | | -1548.5 | | -1213.4 | | | |
| $LL(0)$ | | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | | 0.30 | | 0.45 | | | |

¹< 10 years experience: add; \geq 10 years experience: subtract

For developers with less than 10 years of experience the context effect is negative, meaning an increasing effect on the part-worth utility. A negative context effect means that for the less experienced subgroup the part-worth utility of *Toys & Sporting Goods* at the furniture strip in the first part of the experiment is negative, while in the second part of the experiment this is positive. This may indicate that less experienced developers are more willing to seek for consensus if other stakeholders are involved regarding the location of *Toys & Sporting Goods* at the furniture strip. The fact that only one significant subsample effect was found once again confirms that the group of developers is rather homogeneous.

8.6.2 Model estimations including subsamples retailers

Based on the size of the total sample it was possible to make subsamples based on the characteristic “type of retail organization” (collaborative or independent) and “representing size of shops” ($>1.000 \text{ m}^2$ or $<1.000 \text{ m}^2$). These characteristics do not correlate, as was concluded in chapter 7 (section 7.2.2.). In Table 8.11 the results of the model estimation are shown. The **Type**-labels stand for type of retail organization, while the **Size**-labels stand for the size of the shops they prefer. It is obvious that adding the Type- and Size-variables leads to a better goodness-of-fit for the retailers. The Rho^2 adjusted increased from 0.16 to 0.22 for the MNL model and from 0.38 to 0.39 for the ML model. According to the likelihood ratio test, both the MNL model and the ML model outperform the models without the sample-variables (as shown in Table 8.8). Table 8.11 shows that the number of significant δ -parameters is much higher in the MNL model compared to the ML model. This could partially be explained by the fact that the ML model already takes heterogeneity into consideration by means of the random β -parameters.

Table 8.11 Estimated parameters retailers (including interaction, context, adaptation and sample variables)

| | | Retailers | | | | | |
|--------------------------------|-----------------------------|-----------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -0.560 | 0.000 | -1.303 | 0.000 | 2.140 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 1.614 | 0.000 |
| X_{2A} | Electr. & Media SS | -1.287 | 0.000 | -2.217 | 0.000 | 3.112 | 0.000 |
| X_{2B} | Electr. & Media FS | - | - | 0.000 | - | 2.782 | 0.000 |
| X_{3A} | Fashion SS | -1.838 | 0.000 | -2.901 | 0.000 | 2.534 | 0.000 |
| X_{3B} | Fashion FS | -1.508 | 0.000 | -2.543 | 0.000 | 3.286 | 0.000 |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_1=X_{1A} \times X_{2A}$ | | 0.787 | 0.001 | 1.288 | 0.000 | | |
| $I_4=X_{1B} \times X_{2B}$ | | 0.413 | 0.015 | - | - | | |
| $I_6=X_{1A} \times X_{4B}$ | | 0.732 | 0.000 | - | - | | |
| $I_9=X_{2A} \times X_{4A}$ | | 0.849 | 0.000 | 0.749 | 0.016 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_{1A}^{Dev} | Toys & Sports SS | 0.363 | 0.032 | - | - | | |
| A_{4B}^{Dev} | Restaurant FS | 0.565 | 0.001 | 0.800 | 0.000 | | |
| A_0^{Lgv} | Both not acceptable | 0.237 | 0.017 | 0.312 | 0.027 | | |
| Sample variables ¹ | | δ | P(Z >z) | δ | P(Z >z) | | |
| Type X_0 | Both not acceptable | -0.522 | 0.000 | -0.693 | 0.000 | | |
| Type X_{1B} | Toys & Sports FS | -0.354 | 0.004 | -0.390 | 0.024 | | |
| Type X_{3A} | Fashion SS | -1.059 | 0.000 | -1.835 | 0.000 | | |
| Type X_{3B} | Fashion FS | -0.484 | 0.000 | -1.670 | 0.000 | | |
| Type A_{1A}^{Dev} | Toys & Sports SS | -0.345 | 0.036 | - | - | | |
| Type A_{2A}^{Dev} | Electr. & Media SS | 0.380 | 0.047 | - | - | | |
| Type Y_{3A} | Fashion SS | -0.031 | 0.008 | -0.347 | 0.032 | | |
| Size X_{1B} | Toys & Sports FS | -0.381 | 0.002 | -0.470 | 0.015 | | |
| Size X_{3B} | Fashion FS | -0.521 | 0.000 | -1.170 | 0.000 | | |
| Size A_0^{Dev} | Both not acceptable | -0.261 | 0.008 | - | - | | |
| Size A_{1A}^{Dev} | Toys & Sports SS | 0.392 | 0.036 | - | - | | |
| Size $A_{1A}^{Dev \times Lgv}$ | Toys & Sports SS | -1.025 | 0.002 | - | - | | |
| Size I_3 | $I_3=X_{1B} \times X_{2A}$ | 0.525 | 0.027 | 1.023 | 0.003 | | |
| $LL(\beta)$ | | -922.0 | | -717.4 | | | |
| $LL(0)$ | | -1186.5 | | -1186.5 | | | |
| $Rho^2_{Adjusted}$ | | 0.22 | | 0.39 | | | |

¹Type: collaborative: add; Independent: subtract

Size: >1.000 m²: add; <1.000 m²: subtract

The consequences of differences between subsamples for the utility that respondents attach to the characteristics of retail plans can be best illustrated by using bar charts. Figure 8.1 and 8.2 illustrate some interesting findings. For example, retailers in general do not prefer *Fashion* to be located at a peripheral location (both X_{3A} and X_{3B} are negative). However there is a significant difference between two types of retailers (collaborative or independent) regarding this topic (measured by $^{Type}X_{3A}$ and $^{Type}X_{3B}$). Figure 8.1 shows that specifically collaborative retailers are against the location of *Fashion* at a peripheral location. Their part-worth utility for the location of *Fashion* at the sport stadium (-2.897 according to the MNL model) can be calculated by adding the utility for the sample variable $^{Type}X_{3A}$ (-1.059) to the preference variable X_{3A} (-1.838). For the independent retailers, the value of the parameter for $^{Type}X_{3A}$ (-1.059) must be subtracted from the mean (-1.838) to calculate the part-worth utility (-0.779). In a same way, the part-worth utilities for the preference variable X_{3B} (*Fashion* at the furniture strip) can be calculated. Although not shown in Figure 8.1, the ML model shows similar patterns. The results also show that collaborative retailers attach a lower utility to the alternative “none of the alternatives is acceptable”, implying that they less often choose this alternative than the independent retailers.

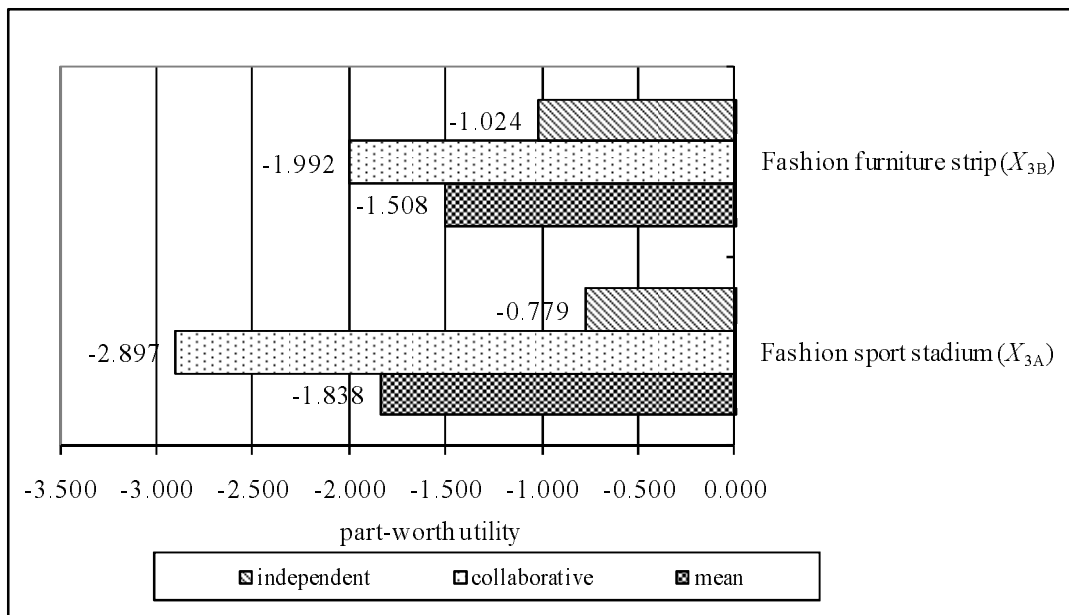


Figure 8.1 Differences in part-worth utilities type of retailers (MNL model)

The part-worth utility of *Toys and Sporting Goods* at the furniture strip (X_{1B}) is not significantly different from zero. However, $^{Type}X_{1B}$ and $^{Size}X_{1B}$ both show negative values for both the MNL (resp. -0.354 and -0.381) and the ML model (resp. -0.390 and -0.470). If a retailer is collaborative and represents a large store format (>1.000 m²) his part-worth utility for locating *Toys and Sporting Goods* at the furniture strip decreases with $-0.354-0.381=-0.735$ (according to MNL).

Figure 8.2 shows differences between subsamples for retailers representing large (> 1.000 m²) and small (≤ 1.000 m²) shop formats. In this figure only the part-worth utility for the location of *Fashion* at the furniture strip (X_{3B}) according to the MNL model is shown. The difference is measured by variable $^{Size}X_{3B}$ (-0.521). We find that for retailers representing larger shop formats the part-worth utility of this characteristic is significantly lower (-2.029) than for the group of retailers representing smaller shop formats (-0.987). The ML model generates the same pattern, although this is not shown in Figure 8.2. Since we also know from Figure 8.1 that collaborative retailers are more against *Fashion* on a furniture strip than independent retailers (expressed by $^{Type}X_{3B}$) we can conclude that in general collaborative retailers and retailers representing large store formats prefer inner cities more for the location of *Fashion* than independent retailers and retailers representing small store formats. Retailers representing large store formats do not prefer *Fashion* to be located at the furniture strip. It is interesting to see that although peripheral locations can offer large shop formats, retailers representing large shop formats and collaborative retailers prevail *Fashion* to be located in inner cities. It may be that these retailers are willing to keep the inner city the place for leisure shopping (including shopping for fashion), since they already invested in the inner cities during the last decades and adding fashion to peripheral locations would lead to undesired competition for their own shop formulas in the inner cities.

There is also some difference in adaptive behaviour between the subsamples, according to the MNL model. For example, $^{Type}A_{1A}^{Dev}$ and $^{Size}A_{1A}^{Dev}$ both have a significant value implying that if retailers represent a large store format and are independent, the adaptation effect becomes $0.363+0.345+0.392=1.100$, which is a considerable increase in adaptive behaviour while their counterparts ('collaborative' retailers representing smaller shops) show a decrease in adaptive behaviour ($0.363-0.345-0.392=-0.374$) regarding *Toys and Sporting Goods* near a sports stadium.

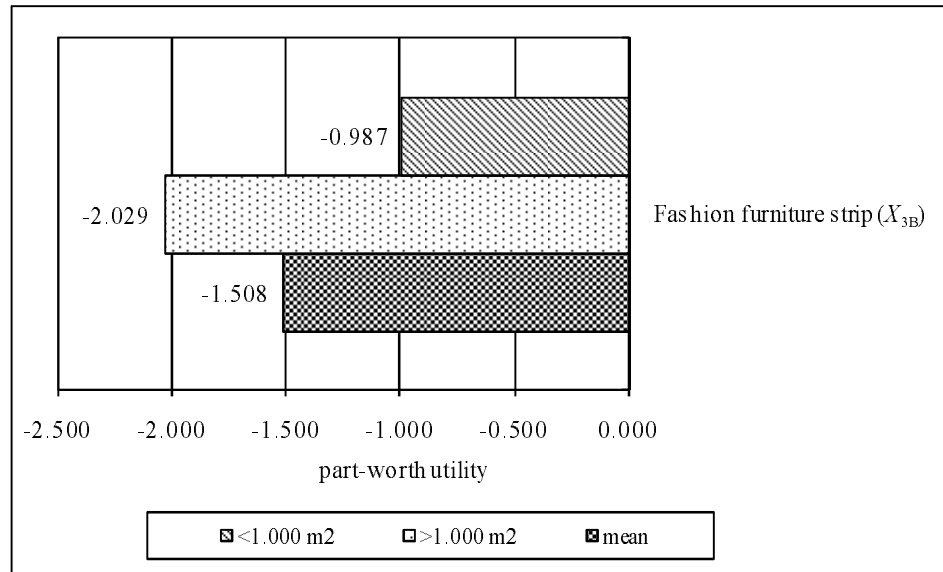


Figure 8.2 Differences in part-worth utilities retailers based on store size (MNL model)

8.6.3 Model estimations including subsamples local governments

Also for local government different subsamples were created based on two characteristics: “The number of citizens” and “the involvement of the respondent with out-of-town retail decisions in the past”. The “number of citizens” was used to create the **Cit**-variables. The first part of the sample represents municipalities with less than 50.000 citizens; the other part represents the bigger municipalities. The other characteristic used to create subsamples were “the involvement of the respondent with out-of-town retail decisions in the past”. The first subsample consists of respondents who were personally involved in an out-of-town retail planning decision. The second subsample represents respondents that did not have any personal experience with these types of decisions. This characteristic was measured using **Inv**-variables. Because the two characteristics are correlated it does not make sense to include both these sample variables into the model simultaneously. For that reason two separate models were estimated; one that included the **Cit**-variables, the other one included the **Inv**-variables.

Especially the model that includes **Cit**-variables shows some interesting results as can be seen in Table 8.12. Specifically planners of larger municipalities (>50.000 citizens) are more against the location of *Fashion* at any peripheral location or the location of *Home Electronics & Media* near the sport stadium than planners of smaller municipalities. These differences are

shown in Figure 8.3. The larger municipalities attach a negative utility to *Home Electronics & Media* at the furniture strip and *Toys & Sporting Goods* near the sport stadium, while the smaller municipalities tend to be positive about these options. The results of the ML model can be interpreted in the same way. The larger municipalities seem to be more conservative. A possible reason for this behaviour may be that larger municipalities try to protect their inner city shopping area as peripheral shopping facilities may drain consumers from the inner city shopping centres. Another reason may be that respondents of larger municipalities have been more often involved in out-of-town retail planning decisions (see Table 7.11) and therefore are used to the former restrictive Dutch policy against retail development at peripheral locations.

According to Table 8.12 only the MNL model shows differences in adaptive behaviour between small and large municipalities ($^{Cit}A_{3B}^{Dev}$ and $^{Cit}A_{2A}^{Ret}$). On average, the local governments do not adapt their utility regarding *Fashion* at the furniture strip if developers are in favour of such alternatives ($A_{3B}^{Dev}=0.0$). However, it can be concluded that the municipalities with >50.000 citizens are more willing to adapt their utility concerning *Fashion* at the furniture strip than the smaller municipalities. This is surprising because we found earlier that these larger municipalities are originally more against *Fashion* at the furniture strip than the smaller ones. Regarding the location of *Home Electronics & Media* near the sport stadium we see that the larger municipalities are less adaptive to the retailers' preferences than the smaller municipalities. Again, the local governments show no adaption to the retailers' preferences regarding *Home Electronics & Media* near the sport stadium on average, but the smaller and larger municipalities show contradicting effects.

Although local governments did not show any context effect on average, if the subsamples are taken into consideration, context effect play a role regarding *Fashion* at the furniture strip (only according to the MNL model). Respondents from the large municipalities become more negative about *Fashion* at the furniture strip if they are informed about the preferences of other stakeholders. Respondents from the small municipalities become less negative.

Finally, both models include a negative parameter for $^{Cit}I_1$. This means that if *Toys & Sporting Goods* and *Home Electronics & Media* are located near the sports stadium, respondents of small municipalities are more against this option than respondents from large municipalities.

Table 8.12 Estimated parameters local governments (including sample variables representing the number of citizens)

| | | Local governments | | | | | |
|-------------------------------|-----------------------------|-------------------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -1.059 | 0.000 | -1.541 | 0.000 | 2.125 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 1.101 | 0.000 |
| X_{1B} | Toys & Sports FS | -0.548 | 0.000 | -0.992 | 0.000 | 0.682 | 0.001 |
| X_{2A} | Electr. & Media SS | -1.119 | 0.000 | -1.762 | 0.000 | 0.930 | 0.000 |
| X_{2B} | Electr. & Media FS | - | - | 0.000 | - | 1.259 | 0.000 |
| X_{3A} | Fashion SS | -3.191 | 0.000 | -6.662 | 0.000 | 2.950 | 0.000 |
| X_{3B} | Fashion FS | -2.849 | 0.000 | -5.285 | 0.000 | 2.147 | 0.000 |
| X_{4A} | Restaurant SS | - | - | 0.000 | - | 1.024 | 0.000 |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_3=X_{1B} \times X_{2A}$ | | 0.471 | 0.034 | - | - | | |
| $I_6=X_{1A} \times X_{4B}$ | | 0.729 | 0.000 | 0.912 | 0.000 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_{2A}^{Dev} | Electr. & Media SS | 0.372 | 0.013 | - | - | | |
| A_{2B}^{Dev} | Electr. & Media FS | 0.265 | 0.044 | 0.547 | 0.004 | | |
| A_{3A}^{Ret} | Fashion SS | 0.516 | 0.011 | 0.910 | 0.001 | | |
| A_{4B}^{Ret} | Restaurant FS | 0.594 | 0.000 | 1.101 | 0.000 | | |
| $A_0^{Dev \times Ret}$ | Both not acceptable | 0.425 | 0.004 | 0.951 | 0.000 | | |
| $A_{1B}^{Dev \times Ret}$ | Toys & Sports FS | 0.806 | 0.005 | 0.848 | 0.035 | | |
| $A_{4A}^{Dev \times Ret}$ | Restaurant SS | - | - | 1.052 | 0.004 | | |
| Sample variables ¹ | | δ | P(Z >z) | δ | P(Z >z) | | |
| $Cit X_0$ | Both not acceptable | 0.245 | 0.001 | - | - | | |
| $Cit X_{1A}$ | Toys & Sports SS | 0.387 | 0.001 | 0.713 | 0.000 | | |
| $Cit X_{2A}$ | Electr. & Media SS | 0.461 | 0.001 | 0.737 | 0.000 | | |
| $Cit X_{3A}$ | Fashion SS | 0.717 | 0.000 | 1.022 | 0.000 | | |
| $Cit X_{3B}$ | Fashion FS | 0.851 | 0.000 | 1.595 | 0.000 | | |
| $Cit A_{3B}^{Dev}$ | Fashion FS | -0.513 | 0.003 | - | - | | |
| $Cit A_{2A}^{Ret}$ | Electr. & Media SS | 0.308 | 0.039 | - | - | | |
| $Cit Y_{3B}$ | Fashion FS | 0.229 | 0.025 | - | - | | |
| $Cit I_1$ | $I_1=X_{1A} \times X_{2A}$ | -0.818 | 0.000 | -1.477 | 0.000 | | |
| $LL(\beta)$ | | -1391.6 | | -1071.2 | | | |
| $LL(0)$ | | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | | 0.37 | | 0.51 | | | |

¹Number of citizens: <50.000: add; >50.000: subtract

Table 8.13 Estimated parameters local governments (including sample variables representing personal involvement in retail planning decisions)

| | | Local governments | | | | | |
|-------------------------------|-----------------------------|-------------------|----------|----------|----------|----------|----------|
| | | MNL | | ML | | | |
| Preference variables | | β | P(Z >z) | β | P(Z >z) | σ | P(Z >z) |
| X_0 | None acceptable alternative | -1.014 | 0.000 | -1.261 | 0.000 | 2.199 | 0.000 |
| X_{1A} | Toys & Sports SS | - | - | 0.000 | - | 1.211 | 0.000 |
| X_{1B} | Toys & Sports FS | -0.584 | 0.000 | -0.700 | 0.001 | 0.927 | 0.000 |
| X_{2A} | Electr. & Media SS | -1.102 | 0.000 | -1.932 | 0.000 | 1.161 | 0.000 |
| X_{2B} | Electr. & Media FS | - | - | 0.000 | - | 1.682 | 0.000 |
| X_{3A} | Fashion SS | -3.059 | 0.000 | -5.441 | 0.000 | 4.670 | 0.000 |
| X_{3B} | Fashion FS | -2.560 | 0.000 | -5.563 | 0.000 | 3.351 | 0.000 |
| X_{4A} | Restaurant SS | - | - | 0.460 | 0.012 | 0.525 | 0.001 |
| Interaction variables | | θ | P(Z >z) | θ | P(Z >z) | | |
| $I_3 = X_{1B} \times X_{2A}$ | | 0.586 | 0.007 | 0.840 | 0.012 | | |
| $I_6 = X_{1A} \times X_{4B}$ | | 0.740 | 0.000 | 1.007 | 0.000 | | |
| $I_7 = X_{1B} \times X_{4A}$ | | - | - | -0.856 | 0.014 | | |
| Adaptation variables | | α | P(Z >z) | α | P(Z >z) | | |
| A_{2A}^{Dev} | Electr. & Media SS | 0.328 | 0.026 | - | - | | |
| A_{2B}^{Dev} | Electr. & Media FS | - | - | 0.549 | 0.005 | | |
| A_{3A}^{Ret} | Fashion SS | 0.524 | 0.008 | 0.839 | 0.004 | | |
| A_{4B}^{Ret} | Restaurant FS | 0.551 | 0.000 | 1.016 | 0.000 | | |
| $A_0^{Dev \times Ret}$ | Both not acceptable | 0.504 | 0.001 | 0.986 | 0.000 | | |
| $A_{1B}^{Dev \times Ret}$ | Toys & Sports FS | 0.838 | 0.003 | 1.070 | 0.009 | | |
| $A_{4A}^{Dev \times Ret}$ | Restaurant SS | - | - | 1.137 | 0.002 | | |
| Sample variables ¹ | | δ | P(Z >z) | δ | P(Z >z) | | |
| $Inv X_{3A}$ | Fashion SS | -0.350 | 0.004 | -1.249 | 0.000 | | |
| $Inv X_{3B}$ | Fasion FS | -0.429 | 0.000 | -1.548 | 0.000 | | |
| $Inv Y_{3A}$ | Fashion SS | 0.391 | 0.002 | 0.644 | 0.000 | | |
| $LL(\beta)$ | | -1434.3 | | -1080.8 | | | |
| $LL(0)$ | | -2208.2 | | -2208.2 | | | |
| $Rho^2_{Adjusted}$ | | 0.35 | | 0.51 | | | |

¹Not involved; add: Involved; subtract

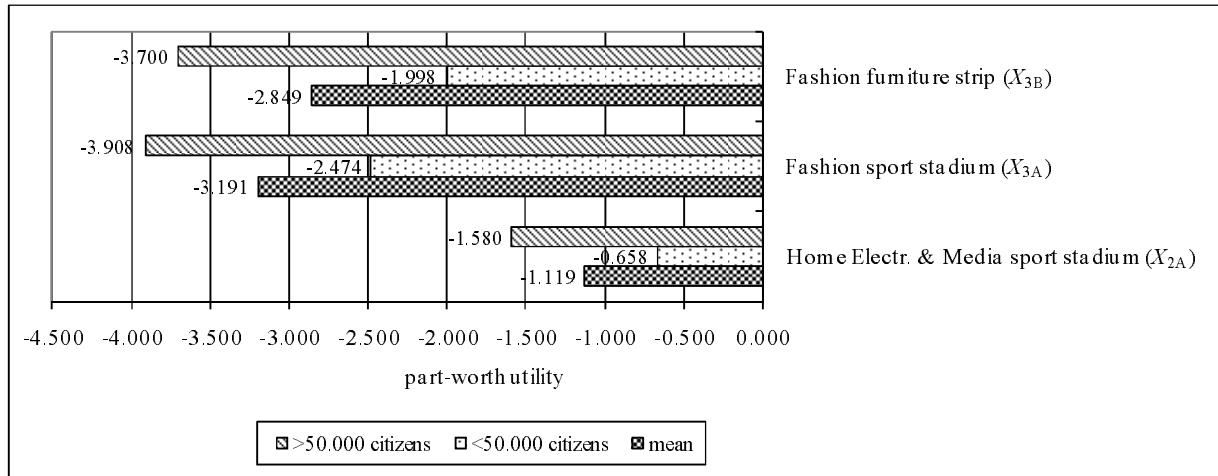


Figure 8.3 Differences in part-worth utilities subsamples based on number of citizens local governments (MNL model)

The estimated parameters for the models taking into consideration differences between respondents who have been and who have not been involved in out-of-town retail planning decisions (the **Inv**-variables) are shown in Table 8.13. As the respondents of the large municipalities have been more often involved in out-of-town retail planning (Table 7.11), the models showed in Table 8.13 do not provide new insights. The models perform somewhat less than the models taking into consideration the number of citizens of the municipalities.

8.7 Likelihood ratio tests

To test whether the extended models significantly perform better than the base model, the likelihood ratio test can be applied. Tables 8.14 to 8.16 show the results of the tests. The contents of a cell is defined as $G2/ndf$ (sig) where $G2$ is the Chi-square statistic ($-2[LL_{reference} - LL_{extended}]$) with ndf degrees of freedom (equal to the difference in the number of parameters between the reference model and the extended model) and sig = $P(|Z|>z)$.

The results show that for all three stakeholder groups the model including adaptation variables performs significantly better than the base models. The best model performances can be reached when also sample variables are included. Moreover, the likelihood ratio tests confirm that the ML models perform significantly better than the MNL models.

Table 8.14 Likelihood ratio test developers' models

| Developers | extended model | | | | | |
|-------------------------|----------------|------------------|--------------------------|-----------------|------------------|-------------------------|
| | MNL base | MNL base +adapt. | MNL base +adapt. +sample | ML base | ML base +adapt. | ML base +adapt. +sample |
| reference model | | | | | | |
| MNL base | | 126.0/6 (0.000) | 134.6/6 (0.000) | 591.0/6 (0.000) | | |
| MNL base+adapt. | | | --- | | 665.2/11 (0.000) | |
| MNL base+adapt. +sample | | | | | | 670.2/13 (0.000) |
| ML base | | | | | 200.2/11 (0.000) | 213.8/13 (0.000) |
| ML base+adapt. | | | | | | 13.6/2 (0.001) |
| ML base+adapt. +sample | | | | | | |

--- No difference in number of parameters

Table 8.15 Likelihood ratio test retailers' models

| Retailers | extended model | | | | | |
|-------------------------|----------------|------------------|--------------------------|-----------------|-----------------|-------------------------|
| | MNL base | MNL base +adapt. | MNL base +adapt. +sample | ML base | ML base +adapt. | ML base +adapt. +sample |
| reference model | | | | | | |
| MNL base | | 27.6/3 (0.000) | 175.6/17 (0.000) | 518.6/5 (0.000) | | |
| MNL base+adapt. | | | 148.0/14 (0.000) | | 536.0/5 (0.000) | |
| MNL base+adapt. +sample | | | | | | 409.2/2 (0.000) |
| ML base | | | | | 45.0/3 (0.000) | 66.2/10 (0.000) |
| ML base+adapt. | | | | | | 21.2/7 (0.000) |
| ML base+adapt. +sample | | | | | | |

Table 8.16 Likelihood ratio test planners' models⁴

| Local governments | extended model | | | | | |
|-------------------------|----------------|------------------|--------------------------|-----------------|------------------|-------------------------|
| | MNL base | MNL base +adapt. | MNL base +adapt. +sample | ML base | ML base +adapt. | ML base +adapt. +sample |
| reference model | | | | | | |
| MNL base | | 85.0/5 (0.000) | 207.8/15 (0.000) | 642.2/7 (0.000) | | |
| MNL base+adapt. | | | 122.8/10 (0.000) | | 690.6/10 (0.000) | |
| MNL base+adapt. +sample | | | | | | 640.8/3 (0.000) |
| ML base | | | | | 133.4/8 (0.000) | 206.4/11 (0.000) |
| ML base+adapt. | | | | | | 73.0/3 (0.000) |
| ML base+adapt. +sample | | | | | | |

⁴ The sample-variables included in the planner's models are the Cit-variables (based on the number of citizens).

8.8 Discussion and conclusion

In this chapter the results of the online choice experiment among three groups of stakeholders (developers, retailers and local governments) were discussed. Both a multinomial and a mixed logit model were used to measure preferences for retail development options and adaptive behaviour. To measure the mean preferences of stakeholders a base model was estimated including preferences variables, interaction variables and context variables. This model was stepwise extended first by adding adaptation variables to measure adaptive behaviour, second by adding sample variables to measure differences between subsamples. With respect to the model performances it can be concluded that the adjusted Rho^2 values were satisfying for the retailers' models and extremely good for the developers' and local governments' models. An explanation for the lower values for the retailers' model may be the smaller number of respondents and heterogeneity within the sample. More important is the mutual comparison of the performances of the base model and the extended versions. Likelihood ratio tests showed that for all three stakeholder groups the model including adaptation variables performed significantly better than the base models. It can be concluded that adaptive behaviour plays an important role in multi-actor decision making. When deciding on retail plan alternative stakeholders are inclined to adjust their utilities to the choices of other stakeholders involved in the decision making process. Stakeholders are looking for consensus while making decisions concerning retail planning decisions. The best model performances can be reached when also heterogeneity is included in the model. Likelihood ratio tests confirm that the ML models, taking into account taste differences, perform significantly better than the MNL models. Furthermore, models including sample variables perform significantly better than models without sample variables.

Focussing on the main preferences, the results show interesting findings that are typical for the Dutch retail market. All stakeholder groups believed that fashion should not be located at a peripheral retail location. This suits with the general opinion in the Netherlands at the moment. Peripheral, well-accessible locations should attract customers aiming at efficiently buying products while down town shopping areas should attract funshoppers (Evers, *et al.*, 2005). Buying clothes is considered to be a recreational shopping activity and for that reason, fashion should be located in the inner cities. Regarding the location of other retail categories, the stakeholders appeared to be rather indifferent, except for locating Home Electronics & Media

outlets. All stakeholders unanimously reject the option locating this retail category near a sports stadium.

As for the adaptive behaviour the estimated models including adaptation variables showed that developers appeared to be the most adaptive. For almost all retail plan attributes the developers are willing to adapt their viewpoint to the retailers or local governments. This is especially the case for locating fashion at the furniture strip. However, if both the retailers and the local governments would prefer fashion at the furniture strip, the developers behave less cooperatively. All adaptive behaviour that was estimated was cooperative. So, in general, developers are willing to positively adapt their viewpoints to the preferences of other stakeholders. Retailers turned out to be the most persistent in their viewpoints, although some additional differences in adaptive behaviour appeared within subgroups. The local governments showed a limited tendency to adapt their viewpoint to the other stakeholders. Although we found that decision makers are prepared to adapt utilities, for none of the stakeholder groups adaptation effects reversed utilities from negative to positive; decision makers just level off their negative preferences. There is an exception: for the local governments we found one example of changing attitude for toys and sporting goods at the furniture strip. The main effects showed that local governments do not prefer toys and sporting goods to be located at the furniture strip. However, when both the developer and the retailers would be in favour of this retail plan alternative, the preference of local governments turned positive.

In general, the results reflect the background of the stakeholders. Developers facilitate with their development plans market demand and are willing to adapt their viewpoint to the opinion of the other stakeholders. On the other hand, retailers represent this market demand and as such do not allow their demand to be influenced by choices of developers nor local governments. Finally, local governments behave somewhere in between. They used to hold strong positions regarding allocating space to retail functions. This may explain why the local planners are more likely to adapt their opinion when the other stakeholders share the same preference.

Heterogeneity within samples was measured in two ways. First we tested for taste differences by applying ML modelling techniques. It was shown that the goodness-of-fit for all three stakeholder's models improved significantly, especially for the heterogeneous group of retailers. By making subsamples we found that retailers representing shops with large store

formats and collaborative retailers are the most conservative in locating retail categories at peripheral locations. This is especially the case for fashion. Also large municipalities showed most conservative behaviour. It turned out that the group of developers participating in the experiment appeared to be the most homogeneous group. There were almost no significant differences in behaviour within this sample. All developers that participated in the experiment were members of the Dutch Council of Shopping Centres. It may be possible that the ongoing debate within this professional association about the advantages and disadvantages of out-of-town shopping influenced preference formation and eventually led to more consensus within this stakeholder group. The general viewpoint within this association (see e.g. NRW Taskforce Dynamische Winkelgebieden, 2010) is to preserve the inner city as the main location for shopping in order to keep inner cities vivid. It may be expected that also larger collaborative retail organizations as well as experienced municipalities are aware of the national debate on out-of-town shopping. So this may explain that these subsamples are the most conservative as it comes to peripheral retail location decisions.

CHAPTER 9

CONCLUSIONS AND DISCUSSION

9.1 Short summary of the study

This study focused on the location choice decision regarding new retail facilities in the Netherlands. Previous studies assumed that stakeholders (such as planners, real estate developers and retail firms) involved in location decisions make independent, sequential decisions. However, since the introduction of the development planning approach, roles in planning processes have changed and stakeholders have become jointly responsible for the full development process. This research concentrated on retail planning decisions in particular because of the current debate whether or not to permit peripheral retail developments. As a consequence of this new planning approach, location decisions are made in the larger context of stakeholder interactions. Due to interactions between stakeholders, the location preferences of stakeholders may be influenced by the other stakeholders.

The aim of this study was to measure the degree in which adaptive behaviour influences stakeholder preferences. Besides, it revealed preferences for retail planning options for different stakeholder groups. An empirical study was conducted to meet these purposes. Three stakeholder groups (local governments, developers and retailers) were invited to participate in a Web-based conjoint adaptation experiment. Stakeholders were asked which retail plan alternative they preferred for expanding the existing retail structure of the imaginary city “Shop City”. Expansion of retail supply was possible in three retail categories (Toys & Sporting Goods, Home Electronics & Media, Fashion) and a Restaurant. These categories represented the four attributes of the experimental design. The levels for each retail category represented possible locations for expansion of these retail categories; 1) adjacent to a sport stadium, 2) an expansion of a furniture

strip and 3) the inner city. The choice options reflect typical current retail developments, in nature and size, in the Netherlands.

The experiment consisted of two parts. In contrast to the first part of the experiment, in the second part the preferences of the other stakeholders were added to the decision context in order to measure adaptive behaviour. Traditional choice modelling techniques were extended by including adaptation variables. Besides the commonly used MNL model, the Mixed Logit model was used to measure taste variations.

9.2 Conclusions

This study gave interesting insights that help to explain retail planning decisions. Preferences of stakeholders for retail planning options were estimated as well as adaptive behaviour. In the theoretical part of this study we defined adaptive behaviour as the phenomenon that a decision maker adjusts his/her preferences in accordance with the preferences of other stakeholders within the negotiation process. This adaptive behaviour could be the result of interactions with other decision makers or group members but could also be caused by indirect actions such as, getting informed through media, interactions with other stakeholders that are not the decision makers (such as pressure groups), or experiences from the past. The reconstruction of the initial stage of three real peripheral retail developments showed that interactions between stakeholders occurred, to come to an initial agreement between public and private stakeholders and, to get the plan approved during the political decision making process that follows on this initial agreement between public and private parties. Although not explicitly analysed in the case studies it is obvious that, as a result of these interactions, stakeholders have to adapt their preferences to come to an agreement.

The experimental part of this study confirmed that adaptation plays an important role in retail planning decisions. Here, we focussed on the degree in which three stakeholder groups adjust their preferences to other stakeholders' viewpoints that were provided in the conjoint choice experiment. Tests showed that for all three stakeholder groups the models including adaptation variables performed significantly better than the models without adaptation variables. The group of developers appeared to be the most adaptive. For almost all retail plan attributes the developers were willing to adapt their viewpoints to the retailers and / or local governments. This

is especially the case for locating Fashion at the furniture strip. However, if both the retailers and the local governments would prefer Fashion at the furniture strip, the adaption of the developers does not accumulate. Retailers turned out to be the most persistent in their viewpoints. They were only sensitive to the preference of the developers when locating a Restaurant at the furniture strip and for the local governments when locating Home Electronics & Media at the sport stadium. Local governments showed a limited tendency to adapt their viewpoints to the other stakeholders. Compared with the developers and the retailers, the local planners were more likely to adjust their utilities if both other stakeholders prefer the same retail plan in the choice set. It can be concluded that, in general, the results reflect the background of the stakeholders. Developers facilitate with their development plans market demand and are willing to adapt their viewpoint to the opinion of the other stakeholders. On the other hand, retailers represent this market demand and as such do not allow their demand to be influenced by choices of developers nor local governments. Finally, local governments behave somewhere in between.

Almost all adaptive behaviour that was estimated was cooperative, implying that in general stakeholders are willing to positively adapt their viewpoint to the preferences of other stakeholders. It can be concluded that, generally spoken, stakeholders look for consensus while deciding on retail plans instead of behaving non-cooperatively. However, from the experimental study it was found that, although adaptive behaviour turned out to be cooperative, in general utilities did not reverse from negative to positive. This implies that the stakeholders just level off their negative preference for particular retail plan attributes.

The adaptation effects were used to explain the preferences of the decision makers with the help of the viewpoints of the other decision makers. The adaptation effects were based on the cumulative data collected with the first and second part of the experiment. Besides adaptation effects, context effects were estimated with in the experiment. By defining context effects we were able to analyse the consequences of adding information in the second part of the experiment about other stakeholders' preferences. We found that this effect only occurred among developers for a few attributes. Just for a small part the preferences of the developers can be explained by the fact that information regarding preferences of other stakeholders was provided in the second part of the experiment.

Regarding the preferences of the different stakeholders concerning the different retail plan options it can be concluded that these are typical for the current Dutch retail market. All stakeholder groups believed that Fashion should not be located at a peripheral retail location. This suits with the general opinion that buying clothes is considered to be a recreational shopping activity and for that reason, Fashion should be located in the inner city shopping areas. Peripheral locations are regarded to be the location for goal-oriented shopping motives. With respect to the location of the retail categories Toys & Sporting Goods and a Restaurant, stakeholders appeared to be rather indifferent. However, for the developers the most preferable option for locating a Restaurant was the furniture strip. All stakeholders reject the option of locating the retail category Home Electronics & Media near a sports stadium. The group of developers prefer to locate this retail category at the furniture strip while the retailers and local governments are indifferent in locating this retail category at the furniture strip or the inner city. In general, it seems that although retail planning legislations in the Netherlands have been relaxed, public as well as private stakeholders still show conservative opinions in locating non-food branches other than furniture out of the city centre. Only the developers showed a preference for reinforcing the existing furniture strip of “Shop City” by adding the retail category Home Electronics & Media and a Restaurant.

By distinguishing subsamples taste differences were found within the group of retailers and local governments. Retailers representing shops with large store formats and collaborative (in contrast with independent) retailers are the most conservative in locating retail categories at peripheral locations. This is specially the case for the location of Fashion. Local governments representing large municipalities (> 50.000 inhabitants) showed most conservative behaviour regarding the location of Fashion and Home Electronics & Media at peripheral locations. The group of developers participating in the experiment appeared to be the most homogeneous group. Based on the data of the experiment, there were hardly any significant differences in behaviour within this sample.

The number of respondents for the group of developers and local governments (both 67 respondents) reached far above the minimum number as aimed for. Although the number of retailers that took part in the experiment was smaller (36 respondents), also this number was satisfying. The total number of choices made in the experiment was 5100 (divided over the three stakeholder groups), which was a good base for the estimation of the choice models. The group

of developers were part of a membership list of the Dutch Council of Shopping Centres and were specifically working in the retail sector. The group of retailers represented a broad variety of retail categories. Moreover, they differed in the type of retail organization (independent vs. collaborative) and the size of the shop formats. It can be concluded that the respondents representing the local governments represent this stakeholder group well. They were personally invited based on their profession (policy advisors for economic or spatial affairs). The municipalities they represented differed in size and location within the country.

For the purpose of this study, the use of a Web-based experiment worked out well. It contributed to a high response rate and allowed to generate choice sets automatically. Also the automation of data entry was a big advantage of the used online survey in terms of time savings. The use of icons to represent “Shop City” and the different retail categories seems to have turned out to be a good choice. The respondents were all professionals that ought to be familiar with the used icons and the interpretation of the map of “Shop City”. There were no reasons to believe that the representation of the choice problem led to interpretation errors. It contributed to create a simplified representation of a complex decision problem.

The overall fit of the estimated models was satisfying for the retailers’ models and very good for the developers’ and local governments’ models. An explanation for the lower values for the retailers’ model may be the smaller number of respondents and heterogeneity within the sample. Based on likelihood ratio tests, it could be concluded that including adaptation variables significantly improved the model estimations. This confirms our earlier statement that adaptive behaviour plays an important role in multi-actor decision making. The models’ performances could even be improved more by taking heterogeneity in consideration. Likelihood ratio tests confirmed that the Mixed Logit models, taking into account taste differences, performed significantly better than the standard MNL models. Furthermore, models including variables identifying subsamples performed significantly better than models without.

To conclude, this study showed that extending traditional choice experiments enables researchers to capture behavioural aspects like adaptive behaviour within multi-stakeholder decision making models. Previous studies on multi-actor decisions using conjoint experiments (Oppewal *et al.*, 2000; Brewer & Hensher, 2000; Dosman & Adamowisc, 2006; Hensher *et al.*, 2007a) neglected the issue of adaptive behaviour. This study contributes to the existing literature

on multi-actor decision making with a new approach to analyse choice data and to unravel and uncover influence structures.

9.3 Discussion and future research

One of the main conclusions of this study is that stakeholders when deciding on retail plans show adaptive behaviour. The results of the experiment proved that stakeholders are sensitive to the preference of others when forming preferences. Nevertheless, the experiment does not explain why stakeholders adjusted their preferences, although we tried to give some interpretation. Different assumptions can be made why stakeholders' preferences were influenced by the preferences of others. Herd behaviour (e.g. Banerjee, 1992; Shiller, 1995) may explain why stakeholders tend to behave similarly as other professionals involved in retail planning. Also expectations based on earlier observations or actions chosen by others may influence stakeholders' choice behaviour (Manski, 2000). For example, it may be possible that representatives of local governments adapt their preferences to the viewpoints of developers because of positive experiences with a particular developer in the past. Hensher & Puckett (2007) defined contextual interactions factors as reasons why stakeholders adjust preferences, including the consultation of advisors. When we really want to learn more about the motives behind adaptive behaviour, another research approach is required like for example in depth interviews.

The case studies discussed in Chapter 3 showed that besides the initial agreement between public and private stakeholders, the political decision making process that succeeds this initial agreement cannot be neglected. The entire decision making process of developing a new structure plan for a municipality or region takes a long time, usually several years. The experiment in this study covered a snapshot of the real decision making process. It focused on preference formation during the initial stage of the development process before any political debate has been started. That is why the local governments were represented in this experiment by civil servants responsible for economic and / or spatial affairs, not politicians. Nevertheless, during the whole retail planning process, preferences of stakeholders regarding retail plan options may change because of debates, lobbying, media, informal consultations, and so on. This study excluded these effects by employing an experimental approach. However, to better understand these external influences on decision outcomes, future research could explore these external effects as well.

The focus of this study primarily concerned the formation of stakeholders' preferences. However, in reality, preferences, even when adjusted to the preferred options of the other stakeholders, need to be combined and negotiated to arrive at a group choice decision. The results of this study revealed initial preferences of stakeholders and, in addition, their willingness to adapt preferences regarding specific location decisions. This knowledge may be valuable in real world decision making processes. Initiators of a new retail plan may also use this information strategically, in order to anticipate particular adaptation effects during the negotiations. Also, this knowledge may be used as input to the models developed by Hensher and co-authors (Brewer & Hensher, 2000; Hensher *et al.* 2007a and 2007b).

In contrast to the model developed in this study, models assuming non-cooperative behaviour have been formulated as well. Some recent studies have shown the application of game theory to decisions in urban environments (e.g. Lai *et al.*, 2008; Blokhuis, 2010; Samsura *et al.*, 2010). These studies emphasize the non-cooperative behaviour of stakeholders. However, focussing on retail planning decisions, we concluded that stakeholders in general are inclined to behave cooperative. It is plausible that also in other fields of urban planning where public and private parties jointly have to come to an agreement, cooperative behaviour prevails. For this reason cooperative models should receive more attention in research concerning urban planning and development than it has thus far.

Different from other studies dealing with multi-actor decision making models (e.g. Dosman & Adamowisc 2006; Hensher *et al.*, 2007a), this study considered three decision makers in stead of two. In reality, even more decision makers play a role in retail planning decisions besides developers, retailers and local governments. In Chapter 3 we discussed the decision making processes of three real retail development initiatives. Within these processes prominent roles were reserved for provinces and advisors. The approach that was adopted in the experimental part of this study allows the involvement of more than three decision makers. Thus, in future research these stakeholders could be included as well. However, a couple of practical problems may occur when more than three decision makers are included. Firstly, for the addition of the viewpoints of each new stakeholder group the decision context becomes more complex. Increasing complexity of the decision context will hamper the decision maker in making a choice. Secondly, adding more stakeholder groups will lead to an enormous increase in the number of adaptation variables which makes it more difficult to estimate the models. When the number of

variables increases, also more data is required. For some stakeholder groups it will be difficult to get enough respondents. For example, since we have only twelve provinces in the Netherlands, it may be hard to reach enough respondents that are experienced in retail planning. However, if more than three or four stakeholders are involved, not all stakeholders need to be included simultaneously in the experiment. One could decide to select for each stakeholder the two or three most important other stakeholders and ignore the less important stakeholders, or, alternatively, utilize multiple experiments for each stakeholder with different compositions of the set of other stakeholders.

BIBLIOGRAPHY

- Adams, D. (1994), *Urban Planning and the Development Process*, UCL Press, London.
- Adams, D., A. Disberry, N. Hutchison and T. Munjoma (2002), Retail location, competition and urban redevelopment, *The Service Industries Journal*, 22(3), 135-148.
- Alexander, E.R. (1998), Planning and implementation: Coordinative planning in practice, *International Planning Studies*, 3 (3), 303-320.
- Alsnih, R. (2006), Characteristics of web-based surveys and applications in travel research. In: *Travel Survey Methods, Quality and Future Directions*, P.R. Stopher and C. Stecher (Eds), Elsevier, Oxford, 569-592.
- Arentze, T.A. (1999), *A Spatial Decision Support System for the Planning of Retail and Service Facilities*, Ph. D. Thesis, Eindhoven University of Technology, Eindhoven.
- Arentze, T.A., A.W.J. Borgers, H.J.P. Timmermans and R. Del Mistro (2003), Transport stated choice responses: Effects of task complexity, presentation format and literacy, *Transportation Research Part E*, 39, 229-244.
- Arentze, T.A., H. Oppewal and H.J.P. Timmermans (2005), A multipurpose shopping trip model to assess retail agglomeration effects, *Journal of Marketing Research*, 42(1), 109-115
- Aribarg, A., N. Arora, and H.O. Bodur (2002), Understanding the role of preference revision and concession in group decisions, *Journal of Marketing Research*, 39 (3), 336-349.

- Babin, B.J., W.R. Darden and M. Griffin (1994), Work and / or fun: Measuring hedonic and utilitarian shopping value, *Journal of Consumer Research*, 20(4), 644-656.
- Bachrach, P. and A. Botwinick (1992), *Power and Empowerment: A Radical Theory of Participatory Democracy*, Temple University Press, Philadelphia.
- Bak, L. (2000), Het onveranderende consumentengedrag. In: *Winkels in de 21^{ste} eeuw*, F. Boekema, B. Spierings and J. van de Wiel (Eds.), Arko Uitgeverij, Nieuwegein, 109-113.
- Banerjee, A.V. (1992), A simple model of herd behaviour, *The Quarterly Journal of Economics*, 107(3), 797-817.
- Bazerman, M.H., J.R. Curhan, D.A. Moore and K.L. Valley (2000), Negotiation, *Annual Review of Psychology*, 51, 279-314.
- Ben-Akiva M. and S.R. Lerman (1985), *Discrete Choice Analysis: Theory and Application to Travel Demand*, The MIT Press, Cambridge, MA.
- Ben-Akiva, M. and M. Bierlaire (1999), Discrete choice methods and their application in short term travel decisions. In: *Handbook of Transportation Science*, R.W. Hall (Ed.), Kluwer Academic Publishers, Massachusetts, USA, 5-33.
- Bhat, C.R. (2001), Quasi-random maximum simulated likelihood estimation of the mixed multinomial logit model, *Transportation Research*, 35B, 677-695.
- Binmore, K., A. Shaked and J. Sutton (1989), An outside option experiment, *The Quarterly Journal of Economics*, 104(4), 753-770.
- Blauw Research (2010), *Multichannel Monitor 2010*, retrieved 4/10/10, from <http://www.thuiswinkel.org>.

- Blokhuis, E.G.J. (2010), *Governing Multi-Actor Decision Processes in Dutch Industrial Area Redevelopment*, Ph. D. Thesis, Eindhoven University of Technology.
- Boekema, F.J., J. Buursink and J. van de Wiel (1996), *Het Behoud van de Binnenstad als Winkelhart*, Van Gorcum, Assen.
- Borchert, J.G. (1995), Binnenstad of periferie, fun of run?, *Geografie*, 4 (1), 4-8.
- Borchert, J.G. (1998), Spatial dynamics of retail structure and the venerable retail hierarchy, *GeoJournal*, 45, 327-336.
- Borgers A.W.J. and H.J.P. Timmermans (1993), Transport facilities and residential choice behavior: A model of multi-person choice processes, *Papers in Regional Science*, 72(1), 45-61.
- Borgers, A.W.J., S. van Swaaij and I.I. Janssen (2006), Assessing the impact of peripheral mega retail centres on traditional urban shopping centres, *Belgeo*, 1(2), 53-66.
- Borgers, A.W.J., M. Brouwer, T. Kunen, J. Jessurun and I.I. Janssen (2010), A virtual reality tool to measure shoppers' tenant mix preferences, *Computers, Environments and Urban Systems*, 34, 377-388.
- Bosnjak, M. and T.L. Tuten (2001), Classifying response behaviors in web-based surveys, *Journal of Computer-Mediated Communication*, 6, retrieved 23/10/09, from <http://jcmc.indiana.edu/vol6/issue3/boznjak.html>.
- Brewer, A.N. and D.A. Hensher (2000), Distributed work and travel behaviour: The dynamics of interactive agency choices between employers and employees, *Transportation*, 27, 117-148.

- Brown, S. (1992), *Retail Location: A Micro-Scale Perspective*, Avebury Ashgate Publishing Limited, Aldershold – England.
- Buitelaar, E. (2010), Cracks in the myth: Challenges to land policy in the Netherlands, *Tijdschrift voor Economische en Sociale Geografie*, 101(3), 349-356.
- Burie, J.B. (1982) *Het Machtsspel van Mensen: Over Organisaties en hoe die met elkaar omgaan*, Van Loghum Slaterud bv, Deventer.
- Camerer, C. F. (2003), *Behavioral Game Theory: Experiments in Strategic Interaction*, Princeton University Press, Princeton / Russell Sage Foundation, New York.
- CBS (Centraal Bureau voor de Statistiek) (2010), *Statline Databank*, retrieved 4/10/2010, from <http://www.cbs.nl>.
- Chorus, C.G. (2007), *Traveler Response to Information*, Ph. D Thesis, Delft University of Technology, Delft.
- Christaller, W. (1966), *Central Places in Southern Germany*, [German: 1933] translated by C.W. Baskin, Prentice-Hall, Englewood Cliffs, New Jersey.
- Cook, C., F. Heath and R.L. Thompson (2000), A meta-analysis of response rates in web-or internet based surveys, *Educational and Psychological Measurement*, 60(6), 821-836.
- Corfman, K.P. (1991), Perceptions of relative influence: formation and measurement, *Journal of Marketing Research*, XXVIII, 125-136.
- Dammers, E., F. Verwest, B. Staffhorst, and W. Verschoor (2004), *Ontwikkelingsplanologie. Lessen uit en voor de Praktijk*, Nai Uitgevers, Rotterdam.

- Davies, R.L. (Ed.) (1995), *Retail Planning Policies in Western Europe*, Routledge, London / New York.
- Davies, R.L. and A.G. Champion (1980), *Social Inequality in Shopping Opportunities: How the Private Sector Can Respond*, Tesco Stores, Cheshunt.
- Dawson, J. (2001 a), Retailing at century end: some challenges for management and research, *The International Review of Retail, Distribution and Consumer Research*, 10(2), 119-148.
- Dawson J. (2001b), Strategy and opportunism in European retail internationalization, *British Journal of Management*, 12(4), 253-266.
- DeLisle, J.R. (2005), The evolution of shopping centre research: A 12-year retrospective, *Journal of Shopping Center Research*, 12(2), 1-83.
- Dellaert, B.G.C., M. Prodigalidad and J.J. Louviere (1998), Family members' projections of each other's preference and influence: A two-stage conjoint approach, *Marketing Letters*, 9(2), 135-145.
- Dellaert, B.G.C. and S. Stremersch (2005), Marketing mass-customized products: Striking a balance between utility and complexity, *Journal of Marketing Research*, 42(2), 219-227.
- Dennis, C. (2005), Why do people shop where they do? The attributes of shopping centres that determine where consumers choose to shop, In: *Objects of Desire: Consumer Behaviour in Shopping Center Choices*, C. Dennis (Ed.), Palgrave Mc Millan, London, 41-61.
- Doherty, N.F. and F. Ellis-Chadwick (2010), Internet retailing: The past, the present and the future, *International Journal of Retail & Distribution Management*, 38(11/12), 943-965.

- Dosman, D. and W. Adamowicz (2006), Combining stated and revealed preference data to construct an empirical examination of intrahousehold bargaining, *Review of Economics of the Household*, 4, 15-34.
- Evers, D. (2002), The rise (and fall?) of national retail planning, *Tijdschrift voor Economische en Sociale Geografie*, 93(1), 107-113.
- Evers, D. (2004), *Building for Consumption, An Institutional Analysis of Peripheral Shopping Center Development in Northwest Europe*, Ph. D. thesis, University of Amsterdam, Amsterdam.
- Evers, D., A. van Hoorn and F. van Oort (2005), *Winkelen in Megaland*, Ruimtelijk Planbureau, Den Haag.
- EZ (Ministerie van Economische Zaken) (2000), *Meer met Minder: Naar een Nieuw Ruimtelijk Beleid voor de Detailhandel*, Final report MDW-Werkgroep PDV/GDV, EZ, The Hague.
- Fernie, J. (1995), The coming of the fourth wave: New forms of retail out-of-town development, *International Journal of Retail & Distribution Management*, 23(1), 4-11.
- Furey, S., C. Strugnell and H. McIlveen (2001), An investigation of the potential existence of food deserts in rural and urban areas of Northern Ireland, *Agriculture and Human Values*, 18(4), 447-457.
- Gorter, C., P. Nijkamp and P. Klamer (2003), The attraction force of out-of-town shopping malls: a case study on run-fun shopping in the Netherlands, *Tijdschrift voor Economische en Sociale Geografie*, 94(2), 219-229.
- Greene, W.H. (2007), *NLOGIT Version 4.0: Reference Guide*, Econometric Software, Inc., Plainview USA and Castle Hill, Australia.

- Gumbel, E.J. (1958), *Statistics of Extremes*, Columbia University Press, New York.
- Guy, C.M. (1994), *The Retail Development Process: Location, Property and Planning*, Routledge, New York.
- Guy, C.M. (1998a), Controlling new retail spaces: The impress of planning policies in Western Europe, *Urban Studies*, 35, 953-979.
- Guy, C.M. (1998b), Classifications of retail stores and shopping centres: Some methodological issues, *GeoJournal*, 45(4), 255-264.
- Guy, C.M. (2001), Internationalisation of large-format retailers and leisure providers in western Europe: planning and property impacts, *International Journal of Retail & Distribution Management*, 29(10), 452-461.
- Guy, C.M. (2007), *Planning for Retail Development, A Critical View of the British Experience*, Routledge, London and New York.
- Guy, C. and D. Bennison (2002), Retail planning policy, superstore development and retailer competition, *International Journal of Retail & Distribution Management*, 30(9), 431-434.
- Guy, C., D. Bennison and R. Clarke (2005), Scale economies and superstore retailing: new evidence from the UK, *Journal of Retailing and Consumer Services*, 12(2), 73-81.
- Hämäläinen, R., E. Kettunen, M. Marttunen and H. Ehtamo (2001), Evaluating a framework for multi-stakeholder decision support in water resources management, *Group Decision and Negotiation*, 10, 331-353.
- Healey, P. (1998), Building institutional capacity through collaborative approaches to urban planning, *Environment and Planning A*, 30(9), 1531-1546.

- Healey, P., M. Purdue and F. Ennis (1995), *Negotiation Development*, E&FN Spon, London.
- Heijden, R.E.C.M. van der (1986), *A Decision Support System for the Planning of Retail Facilities: Theory, Methodology and Application*, Ph. D. thesis, Eindhoven University of Technology.
- Hensher, D.A. (1994), Stated preference analysis of travel choices: The state of practice, *Transportation*, 21, 107-133.
- Hensher, D.A. and W.H. Greene (2003), The mixed logit model: The state of practice, *Transportation*, 30, 133-176.
- Hensher, D.A. and S.M. Puckett (2005), Refocussing the modelling of freight distribution in urban areas: the role of supply chain alliances in addressing the challenge of traffic congestion for city logistics, *Transportation*, 32(6), 573-602.
- Hensher D.A., and S.M. Puckett (2007), Theoretical and conceptual frameworks for studying agent interaction and choice revelation in transportation studies, *International Journal of Transport Economics*, XXXIV(1), 17-47.
- Hensher, D.A., S.M. Puckett and J.M. Rose (2007a), Agency decision making in freight distribution chains: Establishing a parsimonious empirical framework from alternative behavioral structures, *Transport Research Part B*, 41, 924-949.
- Hensher, D.A., S.M. Puckett and J.M. Rose (2007b), Extending stated choice analysis to recognise agent-specific attribute endogeneity in bilateral group negotiation and choice: A think piece, *Transportation*, 34, 667-679.
- Hensher, D.A., J.M. Rose and W.H. Greene (2005), *Applied Choice Analysis: A Primer*, Cambridge University Press, Cambridge.

- Hensher, D., N. Shore and K. Train (2006), Water supply security and willingness to pay to avoid drought restrictions, *Economic Record*, 82(256), 56-66.
- Hensher, D.A. and C. Sullivan (2003), Willingness to pay for road curviness and road type, *Transportation Research D*, 8(2), 139-155.
- Hernandez, T. and M. Biasiotto (2001), Retail location decision-making and store portfolio management, *Canadian Journal of Regional Science*, 24(3), 399-418.
- Hieminga, G. (2006), *Projectontwikkeling Marktperspectief & Integrale Gebiedsgerichte Herstructurering*, Economisch Bureau ING, Papyrus, Diemen.
- Hondelink, P. (1993), *Detailhandel een Geschiedenis en Bronnenoverzicht*, NEHA, Amsterdam.
- Howard, E. (2007), New shopping centres: Is leisure the answer? *International Journal of Retail & Distribution Management*, 35(8), 661-672.
- IPD Nederland (2010), *IPD/ROZ Vastgoedindex*, IPD Nederland, retrieved on 1/12/2010, from <http://www.ipd.com>.
- IPO (Inter Provinciaal Overleg) (2006), *Perifere Detailhandel: Gezamenlijke Richtlijnen met betrekking tot Branchebeperkingen*, Letter to the Ministry of VROM, IPO, The Hague.
- Jackson, C. (2006), Retail planning and institutional property investment, *Regional Studies*, 40(5), 555-561.
- Jackson, C. and G. Watkins (2005), Planning policy and retail property markets: Measuring the dimensions of planning interventions, *Urban Studies*, 42(8), 1453-1469.

- Jannette Walen, D. (2005), *Bijzondere Winkelconcepten, De Betekenis voor de Winkelplanning in Nederland*, Hoofdbedrijfschap Detailhandel, The Hague.
- Jansen, S., H. Boumeester, H. Coolen, R. Goetgeluk and E. Molin (2009), The impact of including images in a conjoint measurement task: evidence from two small-scale studies, *Journal of Housing and the Built Environment*, 24, 271-297.
- Jansen-Verbeke, M. (1991), Leisure shopping; A magic concept for the tourism industry?, *Tourism Management*, 12(1), 9-14.
- Janssen, I.I. (2009), Deciding on mega malls, power positions in two initiatives, *Real Estate Research Quarterly*, 8(11), 39-45.
- Janssen-Jansen, L. and J. Woltjer (2010), British discretion in Dutch planning: Establishing a comparative perspective for regional planning and local development in the Netherlands and the United Kingdom, *Land Use Policy*, 27, 906-916.
- Johnson, D.R. and F.P. Johnson (2000), *Joining Together; Group Theory and Group Skills* (7th ed.), Allyn and Bacon, London.
- Jones Lang LaSalle (2009), *Dutch Retail Market Bulletin 2009*, retrieved 1/12/2010, from www.joneslanglasalle.nl.
- Jones Lang LaSalle (2010), *Dutch Capital Markets Outlook 2010*, retrieved 1/12/2010, from www.joneslanglasalle.nl.
- Jong, S.A. (2008), *Belangen en Effecten bij het Ontwikkelingsproces van Perifere Detailhandelslocaties*, Master thesis, Eindhoven University of Technology.
- Kahneman, D. and A. Tversky (1979), Prospect theory, An analysis of decision under risk, *Econometrica*, 47(2), 263-291.

- Kemperman, A.D.A.M. (2000), *Temporal Aspects of Theme Park Choice Behavior*, Ph. D. Thesis, Eindhoven University of Technology, Eindhoven.
- Kemperman, A.D.A.M., M.M.W. Ponjé and H.J.P. Timmermans (2005), Analyzing heterogeneity and substitution in trip making propensity to urban parks: A mixed logit model, *Tourism Analysis*, 10(3), 223-232.
- Kirkup, M., R. de Kervenoael, A. Hallsworth, I. Clarke, P. Jackson and R. Perez del Aguila (2004), Inequalities in retail choice: exploring consumer experiences in suburban neighbourhoods, *International Journal of Retail & Distribution Management*, 32(11), 511-522.
- Klijn E. and G.R. Teisman (2003), Institutional and strategic barriers to public-private partnership: An analysis of Dutch cases, *Public Money & Management*, 23 (3), 137-146.
- Kooijman, D. (1999), *Machine en theater: Ontwerpconcepten van winkelgebouwen*, Uitgeverij 010, Rotterdam.
- Konuş, U., P.C. Verhoef and S.A. Neslin (2008), Multichannel shopper segments and their covariates, *Journal of Retailing*, 84(4), 398-413.
- Krabben, E. van der (2009a), Retail development in the Netherlands: Evaluating the effects of radical changes in planning policy, *European Planning Studies*, 17(7), 1029-1048.
- Krabben, E. van der (2009b), A property rights approach to externality problems: Planning based on compensation rules, *Urban Studies*, 46(13), 2869-2890.
- Krishnamurthi, L. (1988), Conjoint models of family decision making, *International Journal of Research in Marketing*, 5(3), 185-198.

- Lai, S.K., C. Ding, P.C. Tsai, I.C. Lan, M. Xue, C.P. Chiu and L.G. Wang (2008), A game-theoretic approach to urban land development in China, *Environment and Planning B: Planning and Design*, 35, 847-862.
- Lancaster, K.J. (1966), A new approach to consumer theory, *Journal of Political Economy*, 74, 132-157.
- Lancaster, K.J. (1971), *Consumer Demand: A New Approach*, Columbia University Press, New York.
- Leitham, S., R.W. McQuaid and J.D. Nelson (2000), The influence of transport on industrial location choice: a stated preference experiment, *Transportation Research Part A*, 34, 515-535.
- Levy, M. and B.A. Weitz (1995), *Retail Management*, Irwin, Chicago.
- Liu, C. and S. Forsythe (2011), Examining drivers of online purchase intensity: Moderating role of adoption duration in sustaining post-adoption online shopping, *Journal of Retailing and Consumer Services*, 18, 101-109.
- Locatus (2003), *Retailhandboek 2003: Kengetallen voor de detailhandel*, Locatus, Woerden.
- Locatus (2010), *Locatus Explorer*, Databank provided by Locatus, Woerden.
- Louviere, J., D. Hensher and J. Swait (2000), *Stated Choice Methods, Analysis and Application*, Cambridge University Press, Cambridge.
- Lukes, S. (1974), *Power: A Radical View*, Macmillan, London.

- Madrigal, R. and C. M. Miller (1996), Construct validity of spouses' relative influence measures: An application of the direct product model, *Journal of the Academy of Marketing Science*, 24(2), 157-170.
- Mambretti, I. (2007), *Urban Parks Between Safety and Aesthetics: Exploring Urban Green Space Using Visualisation and Conjoint Analysis Methods*, Ph. D. thesis, ETH / Institut für Raum- und Landschaftsentwicklung, Zürich.
- Manski, C.F. (2000), Economic analysis of social interactions, *Journal of Economic Perspectives*, 14(3), 115-136.
- McFadden, D (1974), Conditional logit analysis and subjective probability. In: *Frontiers in Econometrics*, Academic Press, P. Zarembka (ed.) New York, 105-142.
- Mintzberg, H. (1994), *The Rise and Fall of Strategic Planning*, Prentice-Hall, London
- Molin, E.J.E. (1999), *Conjoint Modelling Approaches for Residential Group Preferences*, Ph. D. thesis, Eindhoven University of Technology, Eindhoven.
- Molin, E.J.E., Oppewal, H. and Timmermans, H.J.P. (2000), A Comparison of Full Profile and Hierarchical Information Integration Conjoint Methods to Modeling Group Preferences, *Marketing Letters*, 11 (2), 165-175.
- Montgomery, D.C. (1984), *Design and Analysis of Experiments*, 2nd edition, John Wiley and Sons, New York.
- Morris, M.W., R.O. Larrick and S.K. Su (1999), Misperceiving negotiation counterparts: When situationally determined bargaining behaviors are attributed to personality traits, *Journal of Personality and Social Psychology*, 77(1), 52-67.
- Muthoo, A. (2000), A non-technical introduction to bargaining theory, *World Economics*, 1(2), 145-166.

- Myers, H. and N. Alexander (2007), The role of retail internationalisation in the establishment of a European retail structure, *International Journal of Retail & Distribution Management*, 35(1), 6-19.
- Neale, M.A. and M.H. Bazerman (1991), *Negotiator Cognition and Rationality*, New York, Free Press.
- Neale, M.A. and A.R. Fragale (2006), Social cognition, attribution, and perception in negotiation: the role of uncertainty in shaping negotiation processes and outcomes. In: *Negotiation Theory and Research*, L.L. Thompson (Ed.), Psychology Press, New York.
- Needham, B. (1997), Land policy in the Netherlands, *Tijdschrift voor Economische en Sociale Geografie*, 88(3), 291-296.
- NEPROM (Vereniging van Nederlandse Projectontwikkeling Maatschappen) (2009), *Nieuw Commercieel Vastgoed 2009*, Digital search engine, NEPROM, retrieved on 14/11/2010 from <http://www.neprom.nl>.
- Newell, B.R., D.A. Lagnado and D.R. Shanks (2007), *Straight Choices*, Psychology Press, New York.
- Nida-Rümelin, J., T. Schmidt and A. Munk (1996), Interpersonal dependency of preferences, *Theory and Decision*, 41, 257-280.
- Nijkamp P., M. van der Burch and G. Vindigni (2002), A comparative institutional evaluation of public-private partnerships in Dutch land-use and revitalisation Projects, *Urban Studies*, 39 (10), 1865-1880.
- Nozeman, E. and J. Fokkema (2008), *Handboek Projectontwikkeling*, Neprom, Voorburg.

- NRW Taskforce Dynamische Winkelgebieden (2010), *Dynamiek van Winkelgebieden*, In: M. Reinartz and W. de Wijs (Ed.), Nederlandse Raad voor Winkelcentra, Utrecht.
- Oppewal, H. (1995), *Conjoint Experiments and Retail Planning: Modelling Consumer Choice of Shopping Centre and Retailer Reactive Behaviour*, Ph. D. thesis, Eindhoven University of Technology, Eindhoven.
- Oppewal, H., J.J. Louviere and H.J.P. Timmermans (2000), Modifying conjoint methods to model managers' reactions to business environmental trends: An application to modeling retailer reactions to sales trends, *Journal of Business Research*, 50, 245-257.
- Oppewal, H. and H.J.P. Timmermans (1997), Retailer self-perceived store image and competitive position, *International Review of Retail, Distribution and Consumer Research*, 7, 41-59.
- Orzechowski, M.A. (2004), *Measuring Housing Preferences Using Virtual Reality and Bayesian Belief Networks*, Ph. D. thesis, Eindhoven University of Technology, Eindhoven.
- Orzechowski M.A., T.A. Arentze, A.W.J. Borgers and H.J.P. Timmermans (2006), Alternate methods of conjoint analysis for estimating housing preference functions: Effects of presentation style, *Journal of Housing and the Built Environment*, 20, 349-362.
- Oude Veldhuis, M.C., D.A. Rompelman and J. Fokkema (2000), *Neprom 1974-2000: Werken aan Ruimtelijke Ontwikkeling: Jubileum-Publicatie van de Neprom ter Gelegenheid van haar 25-jarig bestaan*, Vereniging van Nederlandse Projectontwikkeling Maatschappijen (NEPROM), Voorburg.
- Pal, J., D. Bennison, I. Clarke and J. Byrom (2001), Power, policy networks and planning: the involvement of major grocery retailers in the formulation of Planning Policy Guidance Note 6 since 1988, *The International Review of Retail, Distribution and Consumer Research*, 11 (3), 225-246.

- Pfrang, D.C. and S. Witting, (2008), Negotiation office lease contracts; From a game-theoretical towards a behavioral approach, *Journal of European Real Estate Research*, 1(1), 88-105.
- Pinkley, R.L., M.A. Neale and R.J. Bennett (1994), The impact of alternatives to settlement in dyadic negotiation, *Organizational Behavior and Human Decision Processes*, 57, 97-116.
- Priemus, H. (2002), Public-private partnerships for spatio-economic investments: A changing spatial planning approach in the Netherlands, *Planning Practice and Research*, 17 (2), 197-203.
- Priemus, H. (2007), System innovation in spatial development: Current Dutch approaches, *European Planning Studies*, 15(8), 991-1006.
- Priemus, H. and E. Louw (2003), Changes in Dutch land policy: from monopoly towards competition in the building market, *Environment and Planning B: Planning and Design*, 30, 369-378.
- Raiffa H. (2002), *Negotiation Analysis, The Science and Art of Collaborative Decision Making*, The Belknap Press of Harvard University Press, Cambridge.
- Reimers, V. and V. Clulow (2004), Retail concentration: A comparison of spatial convenience in shopping strips and shopping centres, *Journal of Retailing and Consumer Services*, 11, 207-221.
- Rubinstein, A. (1982), Perfect equilibrium in a bargaining model, *Econometrica*, 50(1), 97-109.
- Samsura, D.A., E. van der Krabben and A.M.A. van Deemen (2010), A game theory approach to the analysis of land and property development processes, *Land Use Policy*, 27, 564-578.

- Schröder, H. and S. Zaharia (2008), Linking multi-channel customer behaviour with shopping motives: An empirical investigation of a German retailer, *Journal of Retailing and Consumer Services*, 15, 452-468.
- Shiller, R.J. (1995), Conversation, information, and herd behaviour, *The American Economic Review*, 85(2), 181-185.
- Sounderpandian, J., N. Frank and S. Chalasani (2005), A support system for mediating brownfields redevelopment negotiations, *Industrial Management + Data Systems*, 105(2), 237-254.
- Stopher, P.R. and D.A. Hensher (2000), Are more profiles better than less? Searching for parsimony and relevance in stated choice experiments, Paper presented at the *79th Transportation Research Board Meeting*, Washington D.C., USA.
- Strazzeri, E., E. Cherchi and S. Ferrini (2010), Assessment of regeneration projects in urban areas of environmental interest: A stated choice approach to estimate and quasi-option values, *Environment and Planning A*, 42, 452-468.
- Strugnell, C., S. Furey and H. Farley (2003), Food deserts – An example of social exclusion? *International Journal of Consumer Studies*, 27(3), 229-230.
- Theil, H. (1971), *Principles of Econometrics*, Wiley, New York.
- Thompson, L.L. (2005), *The Mind and Heart of the Negotiator*, 3rd ed., Pearson / Prentice Hall, Upper Saddle River, N.J.
- Thompson, L.L. (2006), *Negotiation Theory and Research*, Psychology Press, New York-Hove.
- Thurstone, L.L. (1927), Psychophysical analysis, *American Journal of Psychology*, 39, 368-389.

- Timmermans, H.J.P., Borgers, A.W.J., Van Dijk, J. and Oppewal, H. (1992), Residential choice behaviour of dual earner households a decompositional joint choice model, *Environment and Planning A*, 24, 517-533.
- Timmermans H.J.P. and E. Hato (2009), Electronic instrument design and user interfaces for activity based modeling, In: *Transport Survey Methods: Keeping Up with A Changing World*, P. Bonnel, M. Lee-Gosseling, J. Smud and J-L. Madre (eds.), Emerald, Bingley, UK, 437-462.
- Timmermans, H.J.P. and J. Zhang (2009), Modeling household activity travel behaviour: Examples of state of the art modeling approaches and research agenda, *Transportation Research Part B*, 43, 187-190.
- Train K. (2003), *Discrete Choice Methods with Simulation*, Cambridge University Press, UK.
- Vielberth, H. (1995), Retail planning policy in Germany, In: *Retail Planning Policies in Western Europe*, R.L. Davies (ed.), Routledge, London, 78-103.
- Voogd, H. and J. Woltjer (2009), *Facetten van de Planologie*, 8th rev. ed., Kluwer, Alphen aan de Rijn.
- Vriens, M., G.H. Loosschilder, E. Rosbergen and D.R. Wittink (1998), Verbal versus realistic pictorial representations in conjoint analysis with design attributes, *The Journal of Product Innovation Management*, 15(5), 455-467.
- VROM (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer) (1991), *Vierde Nota over de Ruimtelijke Ordening Extra*, VROM, The Hague.
- VROM (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer) (2001), *Vijfde Nota over de Ruimtelijke Ordening*, VROM, The Hague.

- VROM (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer) (2004), *Nota Ruimte: Ruimte voor Ontwikkeling*, VROM, The Hague.
- Wang, D., L. Jiuqun and H.J.P. Timmermans (2001), Reducing respondent burden, information processing effort and incomprehensibility in stated preference surveys: principles and properties of paired conjoint analysis. *Transportation Research Record*, 1768, 71–78.
- Weltevreden, J., O. Atzema and K. Frenken (2005), Evolution in city centre retailing: the case of Utrecht (1974-2003), *International Journal of Retail & Distribution Management*, 33 (11), 824-841.
- Weltevreden, J. (2007), Substitution or complementarity? How the internet changes city centre shopping, *Journal of Retailing and Consumer Services*, 14, 192-207.
- Williams, P. and P. Hubbard (2001), Who is disadvantaged? Retail change and social exclusion, *The International Review of Retail, Distribution and Consumer Research*, 11, 267-286.
- Wilkinson, S and R. Reed (2008), *Property Development*, Routledge, London.
- Wrigley, N. (2002), Food deserts in British cities: Policy context and research priorities, *Urban Studies*, 39(11), 2029-2040.

APPENDIX 1

Screen plots electronic survey

The next pages show screen plots of the survey (in Dutch) that was used to collect the data among the group of developers. The surveys for the other stakeholder groups are similar except for the sample characteristics as discussed in chapter 7.

Verstevig de detailhandelsstructuur van gemeente Koopstad

Welkom!

Door op onderstaande link te klikken kunt u deelnemen aan het experiment waarmee uw voorkeuren ten aanzien van de locatie van nieuwe detailhandelsvestigingen worden gemeten.

Het experiment duurt ongeveer 20 minuten

Deelname aan het experiment is anoniem. Indien u van de onderzoeksresultaten op de hoogte gehouden wilt worden, kunt u aan het einde van het experiment uw contactgegevens invullen. Deze gegevens zijn losgekoppeld van de data en zullen niet aan anderen worden verstrekt. Het invullen van contactgegevens is **niet** verplicht.

[Ga naar uitleg experiment](#)

Uitleg experiment

Elke gemeente krijgt wel eens te maken met de vraag hoe de eigen detailhandelsstructuur het beste kan worden versterkt. Sinds de introductie van de Nota Ruimte zijn er ruimere mogelijkheden voor detailhandelsontwikkelingen in de periferie, ongeacht de aard van de branching.

Dit experiment gaat over de uitbreiding van het detailhandelsaanbod van de fictieve gemeente Koopstad. Er zijn drie mogelijke locaties voor deze uitbreiding:

1. Uitbreiding van de binnenstad
2. Uitbreiding van een bestaande woonboulevard
3. Toevoegen van winkelinvoorzieningen bij een sportstadion.

Uitbreiding is mogelijk voor de volgende branchegroepen:

- Mode
- Sport & spel
- Huishoudelijke artikelen & media

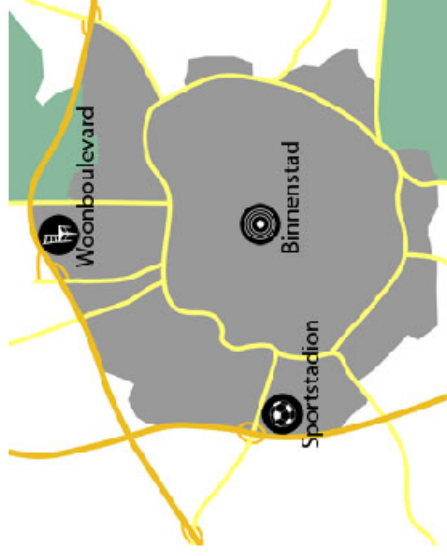
Daarnaast is het mogelijk de locaties "woonboulevard" en "sportstadion" te versterken met een restaurant.

De vraag is welke branchegroepen het beste op welke locatie gevestigd kunnen worden. Op de volgende pagina worden de kenmerken van gemeente Koopstad toegelicht. Daarna wordt het experiment verder uitgelegd.

Volgende

Kenmerken gemeente Koopstad

- Gemeente Koopstad is een middelgrote gemeente (100.000 inwoners) centraal gelegen in Nederland.
- Er is marktruimte voor uitbreiding van het niet-dagelijkse winkelaanbod met 15.000 m² verdeeld over de volgende branchegroepen:
 - mode: 7.500 m²
 - sport & spel: 2.500 m²
 - huishoudelijke artikelen & media: 5.000 m²
- Als locaties voor de uitbreiding zijn aangewezen (zie figuur):
 - de binnenstad,
 - de bestaande woonboulevard (30.000 m² wonen en doe-het-zeif)
 - de locatie bij het sportstadion.
- Een **nieuwe** landelijke keten van restaurants is geïnteresseerd in vestiging bij het sportstadion of op de woonboulevard. Kenmerken van de formule:
 - open van 8.00 uur tot 24.00 uur
 - zelfbediening
 - goede kwaliteit (vers bereid)
 - ruime speelgelegenheid voor kinderen
 - 1.000 m²
- Overige kenmerken gemeente koopstad:
 - de koopkrachtbinding en koopkrachthtoefloeiing uit de regio voor niet-dagelijkse artikelen blijft achter bij dat van soortgelijke gemeenten.
 - de woonboulevard en het sportstadion zijn even goed bereikbaar.



Vervolg uitleg experiment



Hierna krijgt u alternatieve plannen voorgelegd voor uitbreiding van de niet-dagelijkse winkelvoorzieningen in de gemeente Koopstad. Door middel van plaatjes worden de locaties van de branchegroepen en het restaurant weergegeven. De omvang van de pictogrammen voor de branchegroepen staat in verhouding tot het aantal m² uitbreiding. De omvang per branchegroep blijft steeds gelijk.

Boven aan elke pagina heeft u de mogelijkheid de kenmerken van de gemeente Koopstad als geheugensteunje op te roepen.

U krijgt steeds twee alternatieve plannen naast elkaar te zien. Aan u de vraag steeds deze twee alternatieven te vergelijken en aan te geven welk alternatief uw voorkeur heeft. U heeft hiervoor drie antwoordmogelijkheden.

- alternatief Links
- alternatief Rechts
- geen van beiden zijn acceptabel

Om u vertrouwd te maken met de wijze van vraagstelling volgt op de volgende pagina eerst een voorbeeldopgave.

[Vorige](#)[Volgende](#)

Voorbeeldopgave



alternatief Links alternatief Rechts

Welk alternatief heeft uw voorkeur?

- alternatief Links
- alternatief Rechts
- geen van beiden zijn acceptabel

Vorige

Volgende

Dit was de voorbeeldopgave.

In het vervolg van het experiment wordt u gevraagd 15 keer een soortgelijke keuze te maken.

Vervolg experiment

Stelt u zich nu voor dat u met andere partijen moet onderhandelen over de uitbreiding van de detailhandel in de gemeente Koopstad. U vertegenwoordigt de **ontwikkelaar** geïnteresseerd in investeringen in Koopstad.

De andere partijen betrokken bij het besluitvormingsproces zijn:

- De belangenorganisatie voor **winkeliers** in Koopstad.
- De **lokale overheid**, ofwel de gemeente Koopstad

In het vervolg van het experiment krijgt u nogmaals 15 combinaties van alternatieven voorgelegd.

Echter, nu geven we u per alternatief de standpunten van de andere partijen betrokken bij de besluitvorming.

Aan u de vraag zich steeds in te leven in deze standpunten.

Vervolgens dient u wederom steeds twee alternatieve plannen te vergelijken en aan te geven welk alternatief uw voorkeur heeft. U heeft hiervoor drie antwoordmogelijkheden.

- alternatief Links
- alternatief Rechts
- geen van beiden zijn acceptabel

Vorige

Volgende

kenmerken respondent

Wat is uw functie binnen de onderneming?

Hoeveel jaren ervaring heeft u als ontwikkelaar in de retailsector?

 jaren

Is uw onderneming ook in het buitenland actief als ontwikkelaar?

- ja
 nee

Waarin is uw onderneming het meest gespecialiseerd?

- kleinschalige (her)ontwikkelingsprojecten
 grootschalige innovatieve winkelconcepten
 mijn onderneming is in beiden in gelijke mate gespecialiseerd

Vorige

Volgende

kenmerken respondent**Wat is uw leeftijd?****Wat is uw geslacht?**

- man
 vrouw

Indien u op de hoogte wilt worden gehouden van de resultaten van dit onderzoek, kunt u hieronder uw contactgegevens invullen.

Vorige

Volgende

AUTHOR INDEX

A

Adamowicz, W., 51, 61, 145, 147
Adams, D., 21
Alexander, E.R., 14
Alexander, N., 19, 20
Alsnih, R., 85
Arentze, T.A., 2, 29, 72, 87
Aribarg, A., 61
Arora, N., 61
Atzema, O., 9

B

Babin, B.J., 16
Bachrach, P., 55
Bak, L. 16
Banderjee, A.V., 146
Bazerman, M.H., 54, 56
Ben-Akiva, M., 60, 68
Bennett, R.J., 57
Bennison, D., 2, 19
Bhat, C.R., 111
Biasiotto, M., 2
Bierlaire, M., 60

Binmore, K., 57
Blauw Research, 18
Blokhuis, E.G.J., 60, 147
Bodur, H.O., 61
Boekema, F.J., 18
Borchert, J.G., 8, 9, 16
Borgers, A.W.J., 2, 51, 61, 66, 72, 87
Bosnjak, M., 86
Botwinick, A., 55
Boumeester, H., 87
Brewer, A.N., 62, 145, 147
Brouwer, M., 2
Brown, S., 2, 29
Buitelaar, E., 1, 15
Burch, M. van der, 1
Burie, J.B., 56
Buursink, J., 18
Byrom, J., 2

C

Camerer, C.F., 57
CBS, 18
Chalasan, S., 60

Champion, A.G., 26

Cherchi, E., 70

Chiu, C.P., 147

Chorus, C.G., 66

Christaller, W., 8

Clarke, I., 2, 27

Clarke, R., 19

Clulow, V., 2

Cook, C., 86

Coolen, H., 87

Corfman, K.P., 58

Curhan, J.R., 56

D

Dammers, E., 14

Darden, W.R., 16

Davies, R.L., 12, 26

Dawson, J., 19

Deemen, A.M.A., van, 60, 147

DeLisle, J.R., 21

Dellaert, B.G.C., 60, 61

Del Mistro, R., 72, 87

Dennis, C., 2

Ding, C., 147

Disberry, A., 21

Doherty, N.F., 18

Dosman, D., 51, 61, 145, 147

Dijk, J. van, 51

E

Ehtamo, H., 60

Ellis-Chadwick, F., 18

Ennis, F., 34

Evers, D., 2, 8, 12, 13, 16, 23, 27, 28, 30, 137

EZ, 9

F

Farley, H., 27

Fernie, J., 12

Ferrini, S., 70

Fokkema, J., 27, 36

Forsythe, S., 18

Fragale, A.R., 58

Frank, N., 60

Frenken, K., 9

Furey, S., 27

G

Goetgeluk, R., 87

Gorter, C., 16, 17

Greene, W.H., 69, 70, 78, 79, 111

Griffin, M., 16

Gumbel, E.J., 68

Guy, C.M., 2, 12, 13, 16, 19, 20, 21, 23, 25,
26

H

Hallsworth, A., 27

Hämäläinen, R., 60

Hato, E., 85, 86, 87

Healey, P., 1, 14, 34

Heath, F., 86

Heijden, R.E.C.M. van der, 29
Hensher, D.A., 53, 55, 59, 60, 61, 62, 67,
69, 70, 72, 73, 78, 145, 146, 147
Hernandez, T., 2
Hieminga, G., 28
Hondelink, P., 93
Hoom, A. van, 16, 137
Howard, E., 18
Hubbard, P., 27
Hutchison, N., 21

I

IPD Nederland, 22
IPO, 10

J

Jackson, C., 21
Jackson, P., 27
Jannette Walen, D., 8, 10, 12
Jansen, S., 87
Jansen-Verbeke, M., 18
Janssen, I.I., 2, 39, 66
Janssen-Jansen, L., 35
Jessurun, J., 2
Jiuqun, L., 72
Johnson, D.R., 54
Johnson, F.P., 54
Jones Lang LaSalle, 21, 22
Jong, S.A., 39

K

Kahneman, D., 55
Kemperman, A.D.A.M., 60, 70
Kervenoael, R. de, 27
Kettunen, E., 60
Kirkup, M., 27
Konuş, U., 18
Kooijman, D., 16
Klamer, P., 16, 17
Klijn, E., 1
Krabben, E. van der, 9, 24, 29, 38, 60, 147
Krishnamurthi, L., 62
Kunen, T., 2

L

Lagnado, D.A., 54
Lai., S.K., 147
Lan, I.C., 147
Lancaster, K.J., 60
Larrick, R.O., 58
Leitham, S., 61
Lerman, S.R., 68
Levy, M., 29
Liu, C., 18
Locatus, 10, 11, 20
Loosschilder, G.H., 86
Louviere, J.J., 2, 61, 62, 67, 72, 73, 78, 145
Louw, E., 15, 35, 38
Lukes, S., 55

M

Madrigal, R., 62
Mambretti, I., 87
Manski, C.F., 53, 146
Marttunen, M., 60
McFadden, D., 68, 78
McIlveen, H., 27
McQuaid, R.W., 61
Miller, C.M., 62
Mintzberg, H., 55
Molin, E.J.E., 51, 61, 87
Moore, D.A., 56
Montgomery, D.C., 72
Morris, M.W., 58
Munjoma, T., 21
Munk, A., 59
Muthoo, A., 56, 57
Myers, H., 19, 20

N

Neale, M.A., 54, 57, 58
Needham, B., 15
Nelson, J.D., 61
NEPROM, 38
Neslin, S.A., 18
Newell, B.R., 54
Nida- Rümelin, J., 59
Nozeman, E., 36
NRW Taskforce Dynamische
 Winkelgebieden, 23, 33, 139
Nijkamp, P., 1, 16, 17

O

Oort, F. van, 16, 137
Oppewal, H., 2, 29, 51, 61, 62, 145
Orzechowski, M.A., 87, 88, 89
Oude Veldhuis, M.C., 27, 28

P

Pal, J.,
Perez del Aguila, R., 27
Pfrang, D.C., 60
Pinkley, R.L., 57
Ponjé, M.M.W., 70
Priemus, H., 1, 14, 15, 35, 38
Prodigalidad, M., 61
Puckett, S.M., 53, 55, 59, 61, 62, 145, 146,
 147
Purdue, M., 34

R

Raiffa, H., 48, 49, 50, 54, 56
Reed, R., 30
Reimers, V., 2
Rose, J.M., 61, 62, 69, 78, 145, 147
Rompelman, D. A., 27
Rosbergen, E., 86
Rubenstein, A., 56

S

Samsura, D. A., 60, 147
Schmidt, T., 59
Schröder, H., 18

Shaked, A., 57
Shanks, D.R., 54
Shiller, R.J., 146
Shore, N., 61
Sounderpandian, J., 60
Staffhorst, B., 14
Stopher, P.R., 72
Strazzera, E., 71
Stremersch, S., 60
Strugnell, C., 27
Su, S.K., 58
Sullivan, C., 60
Sutton, J., 57
Swaij, S. van, 2, 66
Swait, J., 61, 67, 73, 78

T

Teisman, G.R., 1
Theil, H., 79
Thompson, L.L., 49, 54, 56
Thompson, R.L., 86
Thurstone, L.L., 66, 68
Timmermans, H.J.P., 2, 29, 51, 53, 59, 61,
62, 70, 72, 85, 86, 87, 145
Train, K., 61, 69, 70
Tsai, P.C., 147
Tuten, T.L., 86
Tversky, A., 55

V

Valley, K.L., 56
Verhoef, P.C., 18
Verschoor, W., 14
Verwest, F., 14
Vielberth, H., 12, 13
Vindigni, G., 1
Voogd, H., 35
Vriens, M., 86
VROM, 1, 9, 10, 14, 35

W

Wang, D., 72,
Wang, L.G., 147
Watkins, G., 21
Weitz, B.A.,
Weltevreden, J., 9, 18
Wiel, J. van de, 18
Williams, P., 27
Wilkinson, S., 30
Wittink, D.R., 86
Witting, S., 60
Woltjer, J., 35
Wrigley, N., 27

X

Xue, M., 147

Z

Zaharia, S., 18
Zhang, J., 53, 59

SUBJECT INDEX

A

adaptive behaviour, 3, 4, 48, 59, 63, 65, 74, 93, 118, 137, 141
adaptation effects, 94, 118
 variables, 77, 106, 118, 145
attributes, 62, 83, 105, 141
attribute-levels, 72, 74, 87, 107

B

base model, 105, 106, 112
Belgium, 12
big boxes, 8, 10
blueprint planning, 34

C

Car usage, 16, 25
central place theory, 8
changing demographics, 22
choice data, 3
 modeling, 59, 63
 modeling techniques, 3, 5, 66
 set, 68, 85
 task, 84, 85, 94

citizens, 31
city centres, 8, 9, 13, 16, 17, 21
coordinative planning, 14
cooperative decision making, 49
collaborative planning, 14
compensatory planning, 24
comparison shopping, 17
conjoint experiments, 5, 61, 62, 71, 81, 145
consensus, 3, 45, 65, 105
consumer behaviour, 2, 16
context effects, 117
 variables, 109, 110, 117
 variables, 110
convenience shopping, 17

D

decentralization, 32
decision behaviour, 3
 making process, 4, 33, 65
 process, 3
deregulation, 34
descriptive approaches, 2
developer, 1, 2, 21, 27, 28, 29, 141

development planning, 14, 47, 141
discontinuous attributes, 60
discrete choice models, 5, 60
dummy coding, 73, 107
Dutch Council of Shopping Centres, 139

E

e-commerce, 18
experiment, 3, 4, 65, 145
experimental design, 83

F

factory outlet centres, 8, 10, 12
financial crisis, 21, 22
food deserts, 27
France, 12
fully enclosed shopping malls, 8
fun-shopping, 16, 17
furniture strips, 9, 10

G

game theory, 49, 147
GDV-locations, 9
 -policy, 9, 39, 44
Germany, 12, 13
goal-oriented shopping, 16, 17
goals, 2, 30, 33, 58
goodness-of-fit, 66, 78, 112, 138
group decisions, 48, 51, 61
Gumbel distribution, 68

H

Halton draws, 111
hedonic values, 16
hypermarkets, 8, 12

I

icons, 88, 145
income growth, 18
increasing scale of stores, 19
independent decisions, 2
 retailers, 99
indirect (inter)actions, 54, 59, 142
influence structures, 3, 48, 51, 53, 65, 66
initial stage, 37, 142
intention agreement, 37, 38
interaction effects, 107, 110, 116
 variables, 108
interests, 2, 13, 28, 30, 33, 50, 54, 58
interpersonal dependent preferences, 59
institutional framework, 2
internationalization, 19, 20
Internet purchases, 18, 22
investors, 21, 22

J

joint agreement, 34, 50
joint decision, 47, 61

L

land market, 1
land-market system, 15

landowners, 30
large retail concepts, 8
likelihood ratio test, 79, 105, 112, 135, 145
lobbying, 44
local government, 1, 9, 33
local policy level, 2, 15, 33, 47, 81
location decisions, 1, 2, 3, 29, 61, 141
loglikelihood, 78

M

main effects, 107, 110, 112
market parties, 1, 2
maximum likelihood procedures, 69
media, 31, 142
mixed logit model (ML), 66, 69, 70, 105,
111, 142
multi-actor approach, 15
 decision making theory, 48
multi-attribute negotiations
multinomial logit model (MNL), 66, 70, 105,
111, 142
multi-stakeholder decision behaviour, 2
 decision making, 3, 145

N

negotiation rounds, 3
 power, 51
 theory, 49
negotiations, 33, 34, 49
neighbourhood centres, 17
NL-C Geldermalsen, 41, 42, 44

none-cooperative decision making, 49
 game theory, 60

Nota Ruimte, 1, 10, 14, 29, 34, 83

O

one-stop shopping, 19
out-of-town shopping areas, 12
 retail developments, 12

P

part-worth utility, 67, 74, 75, 76, 81, 105
PDV-locations, 9
 policy, 8, 9
PAULINE, 89, 96
peripheral locations, 7, 9, 12, 15, 29, 69, 105
 retail development, 1, 8, 15, 23
 retail development initiatives, 4, 34
planners, 2, 23, 141
Planning Act, 34, 35, 45
Plein Westermaat, 39-41, 44
policy networks, 2
 levels, 35
 vacuum, 10, 33
political decision making process, 44, 45, 142
 support, 44
power position, 58, 63
 relations, 54
preference formation, 52, 54
 structure, 51, 52, 55
preferences, 2, 4, 34, 47, 52, 53, 59, 63, 65,
74, 93, 105, 141

private parties, 15
product categories, 19
property market circumstances, 21

R

random utility models, 66
 utility theory, 66
real estate development industry, 7, 10, 12
 process, 4
recreational shopping, 16
regional government, 10
restrictive policy, 9
retail categories, 3, 4, 9, 10, 15, 69, 83, 105
 development initiatives, 36
 firms, 1, 29, 61, 141
 park, 8, 10, 12
 plan, 4, 65, 89, 94, 108
 retail planning, 2, 3, 4, 7, 31
 planning decisions, 65, 141
 planning policy, 7, 13, 44
 planning process, 24
 property, 21, 28
 property market, 22, 33
 structure, 4, 8, 12, 19, 33, 45
revealed data, 3, 65
Rho² adjusted, 112
run-shopping, 16, 17

S

sample-variables, 124
self-exclusion, 27

Shop City, 82, 84, 89, 91, 95, 141, 142, 145
shopping centres, 1, 2, 8, 21
 motives, 16
 trip purpose, 16
social exclusion, 26
 interactions, 53
spiral of decline, 23, 47
stakeholder groups, 93, 105, 141, 142
structure plans, 35, 45

T

taste heterogeneity, 5, 105, 111, 144
The Netherlands, 3, 4, 7, 8, 12, 22, 26, 82, 83
Tilburg Mall, 43-45

U

UK, 12, 26
utilitarian values, 16
utility, 60, 66, 74

V

viewpoint, 3, 74

W

Web-based survey, 85, 86
 instrument, 3, 5, 81, 86, 92

Z

zoning plans, 35

SUMMARY

Adaptive Decision Making in Multi Stakeholder Retail Planning

The decision where to locate new retail facilities is increasingly more a multi-stakeholder decision instead of a single-actor decision. In the past, the Dutch Government had a strong hand in determining the program and location for new shopping centres. Since the introduction of the newest national policy document on spatial planning, the so called “Nota Ruimte”, the Dutch government decided to relax restrictions for all retail categories to be located at peripheral locations. Furthermore, with this new policy the responsibility for planning decisions was delegated to local governments. This change in retail planning policy gave room to real estate developers (often cooperating with retail firms) to initiate peripheral retail development. Thus at the present time, planners, retailers and developers, as main actors involved in retail planning, meet each other at the local policy level, to decide on the location of new retail developments.

Previous studies assumed that stakeholders involved in location decisions make independent, sequential decisions. However, since location decisions are made in a larger context of stakeholder interactions, stakeholders have become jointly responsible for the full development process. Nevertheless, the decision behaviour of these stakeholders is neglected within location decision literature. The aim of this study is: (i) to reveal preferences for retail location options of different stakeholder groups, and (ii) to measure the degree in which these preferences are influenced by the preferences of other stakeholders. For this second purpose, the concept of adaptive behaviour is defined as the phenomenon that a decision maker adjusts his/her preferences in accordance with the preferences of other decision makers in order to reach consensus. It is supposed that adaptive behaviour plays a role since stakeholders interact during negotiations and influence each other’s viewpoints in order to reach agreement. To meet both purposes an experimental research approach was used. Three stakeholder groups (local

governments, developers and retailers) were invited to participate in a Web-based conjoint choice experiment.

Before discussing the experiment, the main part of this study, the first chapters of this thesis give a theoretical foundation of the retail planning problem, the retail planning process and multi-actor decision making in general. Chapter 2 of this thesis starts with an explanation of the retail location decision problem. It discusses how retail planning policy in the Netherlands has shifted from a restrictive to a relaxed policy that allows new retail developments to be located at peripheral locations. It also shows that decentralization of planning responsibilities is coherent with more general shifts in planning views. Furthermore, it argues that retail planning decisions have to be made in a very dynamic, constantly changing, decision environment. Consumer behaviour is changing fast, leisure has become more important (often combined with shopping), and the importance of internet as retail channel has increased. On the supply side, increases of scale and internationalization of retail firms have changed the demand for retail property. Finally, market dynamics had a big influence on investor behaviour. Although the interest from institutional investors in shopping centres as an investment asset grew, the financial crisis led to a slowdown of investment and development activities.

Chapter 3 takes a closer look at the processes regarding retail planning decisions from both the planner's and developer's perspective. To understand the course of decision making, insight in formal planning procedures and legal instruments is needed. The most important aspect in this perspective is that, since retail planning policies have been decentralized and relaxed, local and regional governments are now in the middle of revising their structure plans with retail being part of it. In the meantime, several new peripheral retail developments have been initiated which anticipate deregulation. Three of these initiatives were discussed in this chapter. These case studies showed the importance of agreement about the best retail structure for a particular area to get new peripheral retail plans that fit this approved retail structure. Missing consensus will certainly lead to frustration during the development process. Moreover, the case studies showed that even if private and public stakeholders jointly agreed on a plan proposal, the political decision making process that follows may frustrate plan development.

Subsequently, in Chapter 4 the concept of multi-actor decision making is discussed in more detail. It explains that negotiations on retail plan proposals ought to be joint (cooperative) decisions although decision entities may also show non-cooperative behaviour. During the

negotiation process the preferences of each decision maker may be influenced by interactions with other decision makers. When showing cooperative behaviour stakeholders adjust their preferences to reach consensus. This adaptive behaviour is the focus of this study. Preferences can also be influenced by interactions that are not preceded by real actions between the negotiators, such as interactions by media, other stakeholders that are not the negotiators (like pressure groups), or experiences with former interactions. To explain why decision makers may adapt their preferences, different reasons are discussed based on a literature review. These reasons include differences in power positions, interests and perceptions.

Choice modelling is proposed to be a suitable approach to measure retail location preferences and adaptive behaviour of stakeholders. It can deal with multiple discrete attributes and can be applied to multi-stakeholder settings. In the next part of the thesis, the research approach to measure preferences and adaptive behaviour, the data-collection and data-analysis are discussed. In Chapter 5 it is first argued that traditional conjoint experiments and choice modelling techniques have to be extended in order to collect data on adaptive behaviour. It is explained how adaptation and context variables can be derived from the data collected with choice experiments. Each respondent had to choose the most preferred alternative (retail plan) from sets of alternative retail plans. The experiment consists of two parts. In contrast to the first part of the experiment, in the second part the preferences of the other stakeholders were added to the decision context. The context variables could be derived by measuring the differences in preferences between the first and the second part of the experiment. The adaptation variables were obtained by assuming positive additional attribute effects for the alternatives chosen by the other stakeholders and negative attribute effects for the other choice alternatives. These adaptation variables measure the degree that preferences of decision makers are affected by the preferences of other the stakeholders.

Based on these principles, a Web-based conjoint choice experiment is developed as described in Chapter 6. Three stakeholder groups (local governments, developers and retailers) were invited to participate in a Web-based conjoint adaptation experiment. Stakeholders were asked which retail plan alternative they prefer for expanding the existing retail structure of the imaginary city "Shop City". Expansion of retail supply was possible in three retail categories (Toys and Sporting Goods, Home Electronics & Media, Fashion) and a Restaurant. These four categories represented the attributes of the experimental design. The levels for each category

represented possible locations for expansion of these retail categories; 1) adjacent to a sport stadium, 2) an expansion of a furniture strip and 3) the inner city. The choice options reflect typical current retail developments, in nature and size, in the Netherlands.

The data-collection procedure and the response have been discussed in Chapter 7. Every respondent had to make two times fifteen choices. Tests with students showed that this number of choices was good to handle without becoming indifferent. A total number of 170 respondents (67 developers, 67 local governments and 36 retailers) made 5100 choices, which was a good base for model estimations. Although the number of retailers that took part in the experiment was relatively small, it reaches the number that was aimed for, resulting in satisfying modelling results. Based on the characteristics of the respondents we can conclude that they were a good representation of the stakeholder groups in practice.

The analysis of the results that are discussed in Chapter 8 provides interesting insights that help to explain retail planning decisions. Results show that adaptive behaviour plays an important role in these decisions. Tests showed that for all three stakeholder groups the models including adaptation variables performed significantly better than the models without adaptation variables. Except for some developer's models, including context variables did not lead to significantly better model estimations. In general, the results reflect the background of the stakeholders. The group of developers appeared to be the most adaptive. Developers facilitate with their development plans market demand and are willing to adapt their viewpoint to the opinion of the other stakeholders. Retailers turned out to be the most persistent in their viewpoints. They represent market demand and as such do not allow their preferences to be influenced by choices of developers nor local governments. Finally, local governments behave somewhere in between. Almost all adaptive behaviour that was estimated was cooperative, implicating that in general stakeholders are willing to positively adapt their viewpoint to the preferences of others. In general, negative part-worth utilities did not turn positive, but became less extreme, potentially increasing the level of consensus.

Regarding the preferences of the different stakeholders concerning the different retail plan options it can be concluded that these are typical for the current Dutch retail market. All stakeholder groups believed that Fashion should not be located at a peripheral retail location. This suits with the general opinion that buying clothes is considered to be a recreational shopping activity and for that reason, Fashion should be located in the inner city shopping areas. Peripheral

locations are regarded to be the location for goal-oriented shopping motives. With respect to the location of the retail categories Toys & Sporting Goods and a Restaurant, stakeholders appeared to be rather indifferent. For the developers, however, the most preferable option for locating the Restaurant was the furniture strip. All stakeholders reject the option of locating the retail category Home Electronics & Media near a sports stadium. The group of developers prefer to locate this retail category at the furniture strip while the retailers and local governments are indifferent in locating this retail category at the furniture strip or the inner city. In general, it seems that although retail planning legislations in the Netherlands has been relaxed, public as well as private stakeholders still show conservative opinions in locating non-food branches other than furniture out of the city centre.

Including adaptation variables significantly improved the model estimations. The models' performances could even be improved more by taking heterogeneity in consideration. It was found that Mixed Logit models, taking into account taste differences, performed significantly better than standard MNL models. Furthermore, models including variables indentifying subsamples performed significantly better than models without.

To conclude, this study showed that extending traditional choice experiment enables researchers to capture behavioural aspects like adaptive behaviour within multi-stakeholder decision models. The results of the experiment do not explain why stakeholders adjusted their preferences, although a literature review gave some suggestions. Future research could explore these motives underlying adaptive behaviour by applying in-depth interviews, for example. Finally, future research could focus on the way information about preferences and adaptive behaviour in retail planning can be used as input for new location decision models that cover several negotiation steps.

CURRICULUM VITAE

Ingrid Janssen (1971, Eindhoven) began her career as a commercial real estate manager in Maastricht. She was responsible for the management of a real estate portfolio with a focus on retail. Since 2000 she is affiliated with the Chair of Real Estate Management of the Eindhoven University of Technology as assistant professor. She teaches in different areas such as “commercial real estate markets”, “retail real estate”, “mixed use and real estate exploitation”, “real estate management” and “market and feasibility studies”.

Ingrid Janssen studied Business Sciences at the Fontys Hogeschool Eindhoven, where she received her first bachelor degree. After graduating in 1992, she continued her studies at the Eindhoven University of Technology where she received a Bachelor of Science in Architecture, Building and Planning and a Master of Science (cum laude) in Real Estate Management and Development in 1997. Her master thesis dealt with the feasibility of restructuring of second hand office buildings.

Her research activities focus on retail real estate, real estate asset and property management and decision making in real estate. She is author of several publications on these topics in professional and scientific journals. In June 2011, she will co-chair the Annual European Real Estate Conference.

BOUWSTENEN is een publikatiereeks van de Faculteit Bouwkunde, Technische Universiteit Eindhoven. Zij presenteert resultaten van onderzoek en andere activiteiten op het vakgebied der Bouwkunde, uitgevoerd in het kader van deze Faculteit.

BOUWSTENEN zijn telefonisch te bestellen op nummer
040 - 2472383

Kernredactie
MTOZ

Reeds verschenen in de serie
BOUWSTENEN

nr 1
Elan, a computermodel for building energy design, theory and validation
M.H. de Wit
H.H. Driessen
R.M.M. van der Velden

nr 2
Kwaliteit, keuzevrijheid en kosten
Evaluatie van experiment Klarendal, Arnhem
drs J. Smeets
C. le Nobel, arch. HBO
M. Broos, J. Frenken, A. v.d. Sanden

nr 3
Crooswijk
van 'bijzonder' naar 'gewoon'
drs V. Smit
ir K. Noort

nr 4
Staal in de woningbouw
ir E.J.F. Delsing

nr 5
Mathematical theory of stressed skin action in profiled sheeting with various edge conditions
ir A.W.A.M.J. v.d. Bogaard

nr 6
Hoe berekenbaar en betrouwbaar is de coëfficiënt k in \underline{x} - ko en \underline{x} - ks?
ir K.B. Lub
drs A.J. Bosch

nr 7
Het typologisch gereedschap
Een verkennende studie omtrent typologie en omtrent de aanpak typologisch onderzoek
J.H. Luiten arch. HBO

nr 8
Informatievoorziening en beheerprocessen
ir A. Nauta / drs J. Smeets (red.)
Prof. H. Fassbinder (projectleider)
ir A. Proveniers,
drs J.v.d. Moosdijk

nr.9
Strukturering en verwerking van tijdgegevens voor de uitvoering van bouwwerken
ir W.F. Schaefer
ir P.A. Erkelens

nr 10
Stedebouw en de vorming van een speciale wetenschap
K. Doevendans

nr 11
Informatica en ondersteuning van ruimtelijke besluitvorming
dr G.G. van der Meulen

nr 12
Staal in de woningbouw, corrosie-bescherming van de begane grondvloer
ir E.J.F. Delsing

nr 13
Een thermisch model voor de berekening van staalplaatbetonvloeren onder brandomstandigheden
ir A.F. Hamerlinck

nr 14
De wijkgedachte in Nederland
Gemeenschapsstreven in een stedebouwkundige context
dr ir K. Doevendans
dr R. Stolzenburg

nr 15
Diaphragm effect of trapezoidally profiled steel sheets.
Experimental research into the influence of force application
ir A.W.A.M.W. v.d. Bogaard

nr 16
Versterken met spuit-ferrocement.
Het mechanische gedrag van met spuit-ferrocement versterkte gewapende betonbalken
ir K.B. Lub
ir M.C.G. van Wanroy

- nr 17**
De tractaten van
Jean Nicolas Louis Durand
ir G. van Zeyl
- nr 18**
Wonen onder een plat dak.
Drie opstellen over enkele
vooronderstellingen van de
stedebouw
dr ir K. Doevendans
- nr 19**
Supporting decision making processes
A graphical and interactive analysis of
multivariate data
drs W. Adams
- nr 20**
Self-help building productivity
A method for improving house
building by low-income groups
applied to Kenya 1990-2000
ir P. A. Erkelens
- nr 21**
De verdeling van woningen:
een kwestie van onderhandelen
drs V. Smit
- nr 22**
Flexibiliteit en kosten in het ontwerp-
proces Een besluitvormingonder-
steunend model
ir M. Prins
- nr 23**
Spontane nederzettingen begeleid
Voorwaarden en criteria in Sri Lanka
ir P.H. Thung
- nr 24**
Fundamentals of the design of
bamboo structures
O. Arce-Villalobos
- nr 25**
Concepten van de bouwkunde
Prof. dr ir M.F.Th. Bax (red.)
dr ir H.M.G.J. Trum (red.)
- nr 26**
Meaning of the site
Xiaodong Li
- nr 27**
Het woonmilieu op begrip gebracht
Jaap Ketelaar
- nr 28**
Urban environment in developing
countries
editors: dr ir Peter A. Erkelens
dr George G. van der Meulen
- nr 29**
Stategische plannen voor de stad
Onderzoek en planning in drie steden
Prof. dr H. Fassbinder (red.)
ir H. Rikhof (red.)
- nr 30**
Stedebouwkunde en stadsbestuur
ir Piet Beekman
- nr 31**
De architectuur van Djenné
Een onderzoek naar de historische
stad
P.C.M. Maas
- nr 32**
Conjoint experiments and retail
planning
Harmen Oppewal
- nr 33**
Strukturformen Indonesischer
Bautechnik Entwicklung methodischer
Grundlagen für eine 'konstruktive
pattern language' in Indonesien
Heinz Frick
- nr 34**
Styles of architectural designing
Empirical research on working styles
and personality dispositions
Anton P.M. van Bakel
- nr 35**
Conjoint choice models for urban
tourism planning and marketing
Benedict Dellaert
- nr 36**
Stedelijke Planvorming als
co-productie
Prof. dr H. Fassbinder (red.)

- nr 37**
Design Research in the Netherlands
editors: Prof. dr R.M.Oxman,
Prof. dr ir. M.F.Th. Bax,
Ir H.H. Achten
- nr 38**
Communication in the Building Industry
Bauke de Vries
- nr 39**
Optimaal dimensioneren van gelaste plaatliggers
- nr 40**
Huisvesting en overwinning van armoede
dr.ir. P.H. Thung en dr.ir. P. Beekman (red.)
- nr 41**
Urban Habitat: The environment of tomorrow
George G. van der Meulen,
Peter A. Erkelens
- nr 42**
A typology of joints
John C.M. Olie
- nr 43**
Modeling constraints-based choices for leisure mobility planning
Marcus P. Stemerding
- nr 44**
Activity-based travel demand modeling
D. Ettema
- nr 45**
Wind-induced pressure fluctuations on building facades
Chris Geurts
- nr 46**
Generic Representations
Henri Achten
- nr 47**
Johann Santini Aichel
Dirk De Meyer
- nr 48**
Concrete behaviour in multiaxial compression
Erik van Geel
- nr 49**
Modelling site selection
Frank Witlox
- nr 50**
Ecolemma model
Ferdinand Beetstra
- nr 51**
Conjoint approaches to developing activity-based models
Donggen Wang
- nr 52**
On the effectiveness of ventilation
Ad Roos
- nr 53**
Conjoint modeling approaches for residential group preferences
Eric Molin
- nr 54**
Modelling architectural design information by features
Jos van Leeuwen
- nr 55**
A spatial decision support system for the planning of retail and service facilities
Theo Arentze
- nr 56**
Integrated lighting system assistant
Ellie de Groot
- nr 57**
Ontwerpend leren, leren ontwerpen
dr.ir. J.T. Boekholt
- nr 58**
Temporal aspects of theme park choice behaviour
Astrid Kemperman
- nr 59**
Ontwerp van een geïndustrialiseerde funderingswijze
Faas Moonen

- nr 60**
Merlin: A decision support system for outdoor leisure planning
Manon van Middelkoop
- nr 61**
The aura of modernity
Jos Bosman
- nr 62**
Urban Form and Activity-Travel Patterns
Daniëlle Snellen
- nr 63**
Design Research in the Netherlands 2000
Henri Achten
- nr 64**
Computer Aided Dimensional Control in Building Construction
Rui Wu
- nr 65**
Beyond Sustainable Building
editors: Peter A. Erkelens
Sander de Jonge
August A.M. van Vliet
co-editor: Ruth J.G. Verhagen
- nr 66**
Das globalrecyclingfähige Haus
Hans Löfflad
- nr 67**
Cool Schools For Hot Suburbs
René J. Dierkx
- nr 68**
A Bamboo Building Design Decision Support Tool
Fitri Mardjono
- nr 69**
Driving rain on building envelopes
Fabien van Mook
- nr 70**
Heating Monumental Churches
Henk Schellen
- nr 71**
Van Woningverhuurder naar Aanbieder van Woongenot
Patrick Dogge
- nr 72**
Moisture transfer properties of coated gypsum
Emile Goossens
- nr 73**
Plybamboo Wall-panels for Housing
Guillermo E. González-Beltrán
- nr 74**
The Future Site-Proceedings
Ger Maas
Frans van Gassel
- nr 75**
Radon transport in Autoclaved Aerated Concrete
Michel van der Pal
- nr 76**
The Reliability and Validity of Interactive Virtual Reality Computer Experiments
Amy Tan
- nr 77**
Measuring Housing Preferences Using Virtual Reality And Belief Networks
Maciej A. Orzechowski
- nr 78**
Computational Representations of Words and Associations in Architectural Design
Nicole Segers
- nr 79**
Measuring and Predicting Adaptation in Multidimensional Activity-Travel Patterns
Chang-Hyeon Joh
- nr 80**
Strategic Briefing
Fayez Al Hassan (nog niet gepubliceerd)
- nr 81**
Well Being in Hospitals
Simona Di Cicco
- nr 82**
Solares Bauen Implementierungs- und Umsetzungsaspekte in der Hochschulausbildung in Österreich
Gerhard Schuster

- nr 83**
**Supporting Strategic Design of
workplace Environments with
Case-Based Reasoning**
Shauna Mallory-Hill
- nr 84**
**ACCEL: a Tool for Supporting Concept
Generation in the Early Design Phase**
Maxim Ivashkov
- nr 85**
**Brick-mortar interaction in masonry
under compression**
Ad Vermeltfoort
- nr 86**
Zelfredzaam Wonen
Guus van Vliet
- nr 87**
**Een ensemble met grootstedelijke
allure**
Jos Bosman/Hans Schippers
- nr 88**
**On the Computation of
Well-Structured Graphic
Representations in
Architectural Design**
Henri Achten
- nr 89**
**De Evolutie van een West-Afrikaanse
Vernaculaire Architectuur**
Wolf Schijns
- nr 90**
ROMBO tactiek
Christoph Maria Ravesloot
- nr 91**
**External coupling between building
energy simulation and computational
fluid dynamics**
Ery Djunaedy
- nr 92**
**Design Research in the
Netherlands 2005**
Editors:
Henri Achten
Kees Dorst
Pieter Jan Stappers
Bauke de Vries
- nr 93**
Ein Modell zur baulichen Transformation
Jalil H.Saber Zaimian
- nr 94**
**Human Lighting Demands
Healthy Lighting in an Office
Environment**
Myriam Aries
- nr 95**
**A Spatial Decision Support System for
the Provision and Monitoring of Urban
Greenspace**
Claudia Pelizaro
- nr 96**
Leren Creëren
Adri Proveniers
- nr 97**
Simlandscape
Rob de Waard
- nr 98**
Design Team Communication
Ad den Otter
- nr 99**
**Humaan-Ecologisch
Georiënteerde Woningbouw**
Juri Czabanowski
- nr 100**
Hambase
Martin de Wit
- nr 101**
**Sound Transmission through Pipe
Systems and into Building Structures**
Susanne Bron - van der Jagt
- nr 102**
Het Bouwkundig Contrapunt
Jan Francis Boelen
- nr 103**
**A Framework for a Multi-Agent
Planning Support System**
Dick Saarloos
- nr 104**
**Bracing Steel Frames with Calcium
Silicate Element Walls**
Bright Mweene Ng'andu

nr 105
Naar een nieuwe houtskeletbouw
F.N.G. De Medts

nr 106
Anatomy of Dwelling
Enno Wiersma
(nog niet gepubliceerd)

nr 107
Healing Architecture
Ewa Mosiniak
(nog niet gepubliceerd)

nr 108
Geborgenheid
drs T.E.L. van Pinxteren

nr 109
**Modelling Strategic Behaviour
in Anticipation of Congestion**
Qi Han

nr 110
Reflecties op het Woondomein
Fred Sanders

nr 111
**On Assessment of Wind Comfort
by Sand Erosion**
Gabor Dezso

nr 112
**Bench Heating in Monumental
Churches**
Dionne Limpens-Neilen

nr 113
RE. Architecture
Ana Pereira Roders

nr 114
Toward Applicable Green Architecture
Usama El Fiky

nr 115
**Knowledge Representation Under
Inherent Uncertainty in a Multi-Agent
System for Land Use Planning**
Liyang Ma

nr 116
**Integrated Heat Air and Moisture
Modeling and Simulation**
Jos van Schijndel

nr 117
**Concrete behaviour in multiaxial
compression**
J.P.W. Bongers

nr 118
The Image of the Urban Landscape
Ana Moya Pellitero

nr 119
The Self-Organizing City in Vietnam
Stephanie Geertman

nr 120
**A Multi-Agent Planning
Support System for Assessing
Externalities of Urban Form Scenarios**
Rachel Katoshevski-Cavari

nr 121
**Den Schulbau neu denken, fühlen und
wollen**
Urs Christian Maurer-Dietrich

nr 122
Peter Eisenman Theories and Practices
Bernhard Kormoss

nr 123
User Simulation of Space Utilisation
Vincent Tabak

nr 124
Moisture Transport in Cavity Brick Wall
A. Aghai
(nog niet gepubliceerd)

nr 125
In Search of a Complex System Model
Oswald Devisch

nr 126
**Lighting in Work Environment direct
Effects of Lighting Level and Spectrum
on Pshychophysiological Variables**
Grazyna Goricka
(nog niet gepubliceerd)

nr 127
**Flanking Sound Transmission trough
Lightweight Framed Double Leaf Walls**
Stefan Schoenwald

nr 128

Bounded Rationality and Spatial-Temporal Pedestrian Shopping Behaviour

Wei Zhu

nr 129

Travel information Impact on activity travel pattern

Zhongwei Sun

nr 130

Co-simulation for performance prediction of innovative integrated mechanical energy systems in buildings

Marija Trčka

nr 131

Allemaal Winnen

M.J. Bakker

(nog niet gepubliceerd)

nr 132

Architectural Cue Model in Evacuation Simulation for Underground Space Design

Chengyu Sun

nr 133

Uncertainty and sensitivity analysis in building performance simulation for decision support and design optimization

Christina Hopfe

nr 134

Facilitating distributed collaboration in the AEC/FM sector using Semantic Web Technologies

Jacob Beetz

nr 135

Circumferentially Adhesive Bonded Glass Panes for Bracing Steel Frame in Façades

Edwin Huvener

nr 136

Influence of temperature on concrete beams strengthened in flexure with CFRP

Ernst-Lucas Klamer

nr 137

Sturen op klantwaarde

Jos Smeets

nr 138

Nog niet bekend

Mariette van Stralen

(nog niet gepubliceerd)

nr 139

Lateral behavior of steel frames with discretely connected precast concrete infill panels

Paul Teewen

nr 140

Integral design method in the context of sustainable building design

Perica Savanovic

nr 141

Household Activity-Travel Behavior: Implementation of Within-Household Interactions

Renni Anggraini

(nog niet gepubliceerd)

nr 142

Design Research in the Netherlands 2010

Henri Achten

(nog niet gepubliceerd)

nr 143

Modelling life trajectories and transport mode choice using Bayesian Belief Networks

Marloes Verhoeven

nr 144

Assessing Construction Project Performance in Ghana

William Gyadu-Asiedu

nr 145

Empowering Seniors through Domestic Homes

Masi Mohammadi

nr 146

An Integral Design Concept for Ecological Self-Compacting Concrete

Martin Hunger

nr 147

Governing Multi-Actor Decision Processes in Dutch Industrial Area Redevelopment

Erik Blokhuis

nr 148
A Multifunctional Design Approach for Sustainable Concrete
Götz Hüsken

nr 149
Quality monitoring in infrastructural Design-Build projects
Ruben Favié

nr 150
Assessment Matrix for Conservation of valuable timber structures
Michael Abels

nr 151
Co-simulation of building energy simulation and computational fluid dynamics for whole-building heat, air and moisture engineering
Mohammad Mirsadeghi

nr 152
External coupling of building energy simulation and building element heat, air and moisture simulation
Daniel Cóstola