

Logistische Netzwerke und integrierte taktische Logistikplanung im Lebensmittelhandel

Zusammenfassung der Einzelbeiträge der kumulativen Dissertation

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Katholischen Universität Eichstätt-Ingolstadt

Michael G. Sternbeck

Referent

Prof. Dr. Heinrich Kuhn

Korreferent

Prof. Dr. Dr. h.c. Bernd Stauss



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Inhaltsverzeichnis

1	Übersicht über die Einzelbeiträge	3
2	Beitrag "Integrative retail logistics: An exploratory study"	6
3	Beitrag "Logistische Segmentierung im Lebensmitteleinzelhandel"	8
4	Beitrag "A retail operations planning framework"	10
5	Beitrag "Grocery retail operations and automotive logistics"	12
6	Beitrag "Order packaging quantities in grocery retailing"	14
7	Beitrag "Store delivery patterns in grocery retailing"	16

1 Übersicht über die Einzelbeiträge

Die Beiträge dieser kumulativen Dissertation befassen sich mit logistischen Fragestellungen im stationären Lebensmitteleinzelhandel (LEH). Es werden logistische Netzwerke und die entsprechenden Warenflüsse empirisch untersucht und strukturiert sowie korrespondierende logistische Planungsverfahren analysiert und weiterentwickelt. Diese kumulative Dissertation besteht aus den folgenden Einzelbeiträgen:

1. Kuhn, Heinrich und Sternbeck, Michael G. (2013): **Integrative retail logistics: An exploratory study**, in: Operations Management Research, vol. 6, No. 1, pp. 2-18. (*published*)
2. Sternbeck, Michael und Kuhn, Heinrich (2010): **Differenzierte Logistik durch ein segmentiertes Netzwerk im filialisierten Lebensmitteleinzelhandel**, in: Schönberger, Robert und Elbert, Ralf (Hrsg.): Dimensionen der Logistik – Funktionen, Institutionen und Handlungsebenen, Wiesbaden: Gabler, S. 1009-1038. (*published*)
3. Hübner, Alexander H.; Kuhn, Heinrich; Sternbeck, Michael G. (2013): **Demand and supply chain planning in grocery retail: an operations planning framework**, in: International Journal of Retail and Distribution Management, vol. 41, No. 7, pp. 512-530. (*published*)
4. Sternbeck, Michael G. und Kuhn, Heinrich (2013): **Grocery retail operations and automotive logistics: A functional cross-industry comparison**, forthcoming in: Benchmarking: An International Journal. (*accepted for publication*)
5. Sternbeck, Michael G. (2013): **A store-oriented approach to determine order packaging quantities in grocery retailing**, Working paper, Catholic University of Eichstaett-Ingolstadt. (*under review*)
6. Sternbeck, Michael G. und Kuhn, Heinrich (2013): **An integrative approach to determine store delivery patterns in grocery retailing**, Working paper, Catholic University of Eichstaett-Ingolstadt. (*under review*)



Abbildung 1.1: Thematischer Zusammenhang der Einzelbeiträge

Abbildung 1.1 illustriert den thematischen Zusammenhang der Einzelbeiträge. Der erste Beitrag “Integrative retail logistics: An exploratory study” bildet ein explorativ-empirisches Fundament, auf dem alle weiteren Beiträge aufsetzen. Die Durchführung und Analyse von 28 leitfadengestützten Interviews liefert eine Vielzahl von relevanten Erkenntnissen über logistische Netzwerkstrukturen und integrative Planungsprobleme im LEH, die in die weiteren Beiträge einfließen und auf deren Basis die Optimierungsansätze entwickelt werden. Ein spezifisches Charakteristikum von Lieferketten im LEH ist die horizontale Segmentierung der Warenströme nach unterschiedlichen Dimensionen und Kriterien oder Kombinationen von Kriterien. Der zweite Beitrag liefert basierend auf den empirischen Ergebnissen eine tiefgehende Beschreibung des Segmentierungsansatzes im LEH und der damit verbundenen Planungs- und Entscheidungsprozesse sowie deren Zusammenhang mit der logistischen Effizienz in den Teilsystemen der Lieferkette.

Sowohl die aus der Segmentierung resultierenden Planungsaufgaben als auch die empirisch in Beitrag 1 identifizierten Planungsprobleme finden Eingang in die “Demand and Supply Chain Planungsmatrix” (Beitrag 3), die ein ganzheitliches und strukturiertes Rahmenwerk darstellt, in dem die einzelnen logistischen Planungsprobleme abgebildet sind und ihre Zusammenhänge transparent werden. Dieses erarbeitete Gesamtbild der logistischen Strukturen und der logistischen Planung im LEH bildet die Grundlage für den Vergleich mit der Automobilindustrie in Beitrag 4. Das Ergebnis wiederum liefert Ansatzpunkte für eine Optimierung der Logistikplanung. Sowohl die empirische Untersuchung im LEH als auch der Vergleich mit der Automobilindustrie legen nahe, dass die Filiallogistik stärker und besser als in der Vergangenheit in logistische Kalküle integriert werden muss, um ein höheres Effektivitäts- und Effizienzniveau zu erreichen. Die Beiträge 5 und 6 greifen daher zwei Optimierungsansätze auf, die in den Beiträgen 1 und 4 als für die Filiallogistik besonders relevant identifiziert wurden. In Beitrag 5 wird ein Bewertungs- und Optimierungsmodell zur Selektion filialorientierter Versandgebindegrößen entwickelt. Beitrag 6 liefert einen ganzheitlich integrativen Ansatz zur Bestimmung von Filialbelieferungsmustern, der sowohl die Prozesse in den Verteilzentren und im Transport als auch in der Filiale integriert.

2 Beitrag “Integrative retail logistics: An exploratory study”



Abbildung 2.1: Einordnung des Beitrages “Integrative retail logistics: An exploratory study”

In: Operations Management Research, vol. 6, no. 1, pp. 2-18

Integrative Retail Logistics: An Exploratory Study

Heinrich Kuhn¹, Michael G. Sternbeck^{2,*}

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

Grocery retail companies have gone through a transformational change in the past by heavily investing in distribution centers of their own and by expanding their logistics activities. As a result, many retailers are now in the process of better adjusting their logistics operations to their specific requirements against the backdrop of raising pressure in a highly competitive environment. In this light, we provide an exploratory study based on semi-structured face-to-face interviews with 28 leading European grocery retailers. First we examine the current strategic designs of grocery retailers' internal logistics networks. Next, we shift our focus to the resulting interdependencies in tactical supply chain planning between instore operations and upstream logistics processes. We have identified five interdependent planning issues: order packaging unit, store delivery pattern, store replenishment lead time, store delivery arrival times and arrival time windows, as well as roll-cage sequencing and loading carriers. Each of these mid-term planning interdependencies is evaluated with regard to implications in the stores, in transportation and in the distribution centers. The mid-term operations planning issues in the grocery retail industry considered in this paper have remained practically unexplored up to now. The outcome of this empirical research study therefore has substantial relevance for future retail research and practice.

Keywords: Grocery retailing, retail supply networks, retail supply chain planning, retail operations, planning interdependencies

*Corresponding author

¹Tel. No.: +49 841 937 21823, Fax: +49 841 937 21955, heinrich.kuhn@ku.de

²Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku.de

3 Beitrag “Differenzierte Logistik durch ein segmentiertes Netzwerk im filialisierten Lebensmitteleinzelhandel”



Abbildung 3.1: Einordnung des Beitrages “Differenzierte Logistik durch ein segmentiertes Netzwerk im filialisierten Lebensmitteleinzelhandel”

In: Schönberger, Robert und Elbert, Ralf (Hrsg.) (2010):
Dimensionen der Logistik – Funktionen, Institutionen und Handlungsebenen,
Wiesbaden: Gabler, S. 1009-1038.

Differenzierte Logistik durch ein segmentiertes Netzwerk im filialisierten Lebensmitteleinzelhandel

Michael G. Sternbeck^{1,*}, Heinrich Kuhn²

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

In diesem Beitrag wird dargestellt, wie durch eine Segmentierung des internen Liefernetzwerkes und einer Integration der resultierenden Warenflüsse das handelslogistische Gesamtsystem in höherem Maße auf spezifische Rahmenbedingungen und Anforderungen ausgerichtet werden kann. Durch eine branchenspezifische Analyse der Funktionen werden die Produktivitätstreiber ermittelt, die auf unterschiedlichen Handlungsebenen die Gestaltungsoptionen beeinflussen.

Keywords: Handelslogistik, Logistische Netzwerke im Lebensmittelhandel, Supply Chain Segmentierung

*Corresponding author

¹Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku-eichstaett.de

²Tel. No.: +49 841 937 21823, Fax: +49 841 937 21955, heinrich.kuhn@ku-eichstaett.de

4 Beitrag “Demand and supply chain planning in grocery retail: an operations planning framework”



Abbildung 4.1: Einordnung des Beitrages “Demand and supply chain planning in grocery retail: an operations planning framework”

In: International Journal of Retail & Distribution Management, vol. 41, no. 7, pp. 512-530

Demand and supply chain planning in grocery retail: An operations planning framework

Alexander H. Hübner^{1,*}, Heinrich Kuhn², Michael G. Sternbeck³

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

Purpose – The purpose of this paper is to develop a holistic operations planning framework for grocery retailing. The authors aim to identify, describe and structure coherent demand and supply chain (SC) planning problems in a comprehensive architecture.

Design/methodology/approach – The authors reviewed key literature on retail SC management and sales planning. This built a foundation for the development of an integrated operations planning framework. The findings were evaluated through discussions with retailers and communications with retail planners, including personal interviews with 28 leading European grocery retailers and with people in related positions from the consumer goods industry and consultancies.

Findings – The core of this paper is the development of a coherent demand and SC planning matrix. It demonstrates planning interdependencies and defines a framework for retail operations. The grocery planning framework integrates retail specifics, as well as hierarchical and sequential aspects of decision making. That is why this planning architecture also forms the foundation for research and development of advanced decision support systems.

Practical implications – Planning tasks are identified in interrelated planning modules permitting coordinated and decentralised decision making, which is necessary for operational and complexity reasons. The planning framework assists retail planners in understanding their decision problem from a comprehensive perspective. Better coordination of different modules and further development of retail-tailored analytical models will improve planning quality.

Originality/value – This is the first paper that structures retail demand and SC planning questions coherently in one framework, matching demand and supply from a long- to short-term perspective and from supplier to customer.

Keywords: Supply chain management, Retailing, Retail supply chain management, Supply chain planning, Logistics, Hierarchical planning

*Corresponding author

¹Tel. No.: +49 841 937 21948, Fax: +49 841 937 21955, alexander.huebner@ku.de

²Tel. No.: +49 841 937 21823, Fax: +49 841 937 21955, heinrich.kuhn@ku.de

³Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku.de

5 Beitrag “Grocery retail operations and automotive logistics: A functional cross-industry comparison”

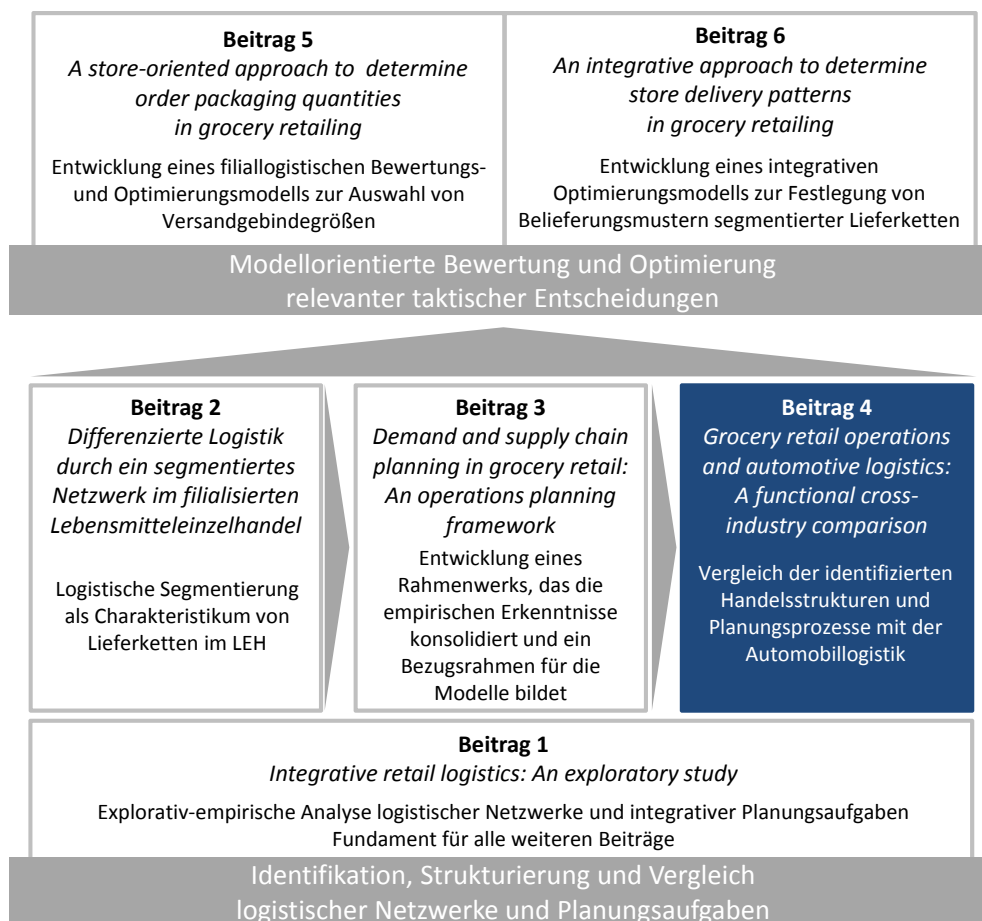


Abbildung 5.1: Einordnung des Beitrages “Grocery retail operations and automotive logistics: A functional cross-industry comparison”

Forthcoming in: Benchmarking: An International Journal

Grocery retail operations and automotive logistics: A functional cross-industry comparison

Michael G. Sternbeck^{1,*}, Heinrich Kuhn²

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

Purpose – The purpose of this paper is to identify and describe similarities between logistics structures and mid-term planning problems in the grocery retail and automotive industries in a specific internal section of their respective supply chains.

Design/methodology/approach – The benchmarking approach is used as a framework for this paper. It is based on insights resulting from several joint projects with grocery retailers and automobile producers. A particular focus of our research was participating in an exchange of ideas and experience between logistics managers in both industry sectors.

Conclusion – We have identified parallels when comparing the internal retail supply chain of the grocery retail industry, which consists of distribution centres, transportation and in-store logistics, with the internal logistics network in the automotive industry, which consists of logistics supermarkets, transportation and work zone operations at the assembly line. Strong similarities have been found for three planning problems related to tactical planning tasks: assigning products and parts to delivery modes, selecting packaging units and loading carriers, and determining delivery cycles. In comparison to retailing, there is a clearer trend in the automotive industry to plan line-back and align processes with the operator's requirements at the assembly line.

Practical implications – For logisticians in grocery retailing and the automotive industry, this paper provides relevant input for functional benchmarking initiatives and offers an inspirational view beyond the horizon.

Originality/value – This paper is the first to focus on similarities in logistics network structures and planning tasks between the two industries from the viewpoint of grocery retailing.

Keywords: Retailing, Automotive industry, Operations, Benchmarking

*Corresponding author

¹Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku.de

²Tel. No.: +49 841 937 21823, Fax: +49 841 937 21955, heinrich.kuhn@ku.de

6 Beitrag “A store-oriented approach to determine order packaging quantities in grocery retailing”

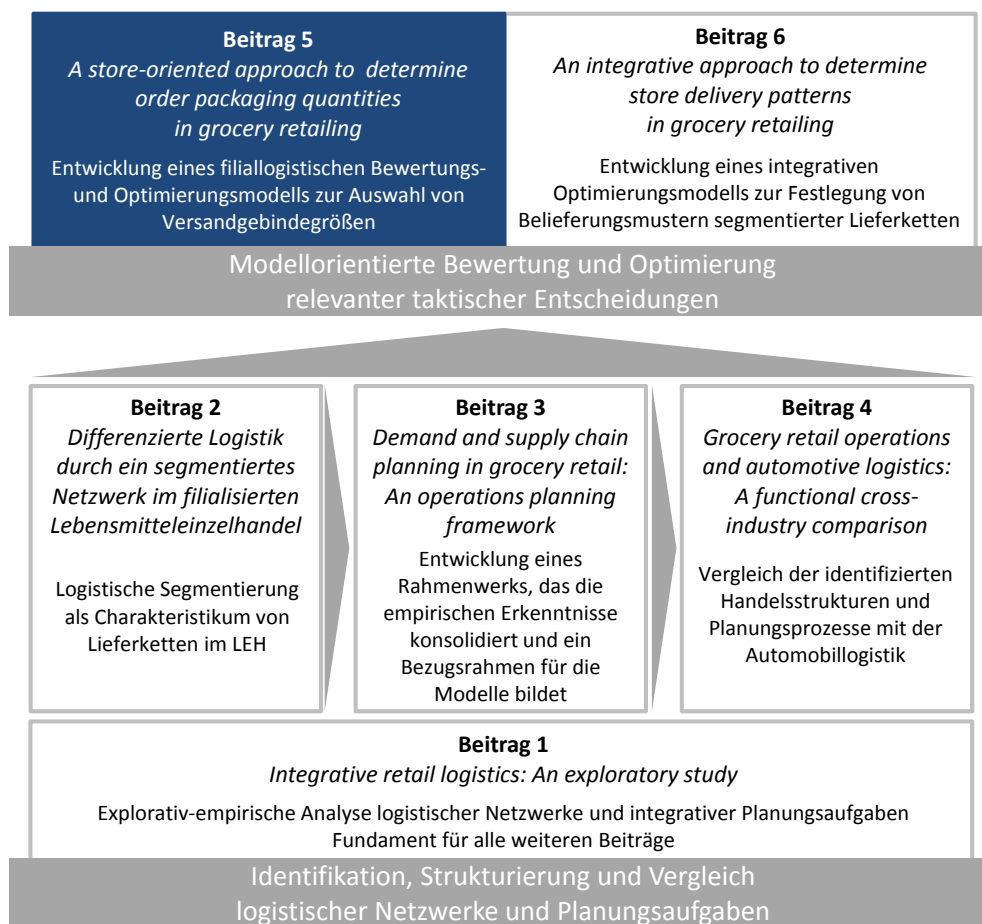


Abbildung 6.1: Einordnung des Beitrages “A store-oriented approach to determine order packaging quantities in grocery retailing”

Working paper (under review), October 2013

A store-oriented approach to determine order packaging quantities in grocery retailing

Michael G. Sternbeck¹

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

Instore operations in bricks-and-mortar grocery retailing account for the highest share of operational logistics costs within the internal retail supply chain. The order packaging quantity (OPQ) is regarded as one important driver of instore logistics efficiency. We define the OPQ as the number of consumer units (CUs) that are bundled into one order and distribution unit for supplying the individual stores. Therefore, the OPQ corresponds to the smallest possible order size and determines the possible granularity of order sizes with an impact on instore operations costs. In this paper, we develop a cost-minimization model including instore handling and inventory carrying costs to determine OPQs. The model developed builds on inventory management theory and is based on discrete probability distributions of consumer demand. We apply the model in an industry case study with real retail data for 39 stock keeping units and 1,180 stores of a European retail company. By applying the cost-optimal OPQ for all stores, the costs considered can be reduced by 9.4%. This paper can be considered as a first in-depth analysis of the dormant instore efficiency potential in connection with adjusted OPQs that seems to be largely untapped in retail research and practice.

Keywords: Retail operations, Instore logistics, Case pack size

¹Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku.de

7 Beitrag “An integrative approach to determine store delivery patterns in grocery retailing”



Abbildung 7.1: Einordnung des Beitrages “An integrative approach to determine store delivery patterns in grocery retailing”

Working paper (under review), October 2013

An integrative approach to determine store delivery patterns in grocery retailing

Michael G. Sternbeck¹, Heinrich Kuhn²

*Catholic University Eichstätt-Ingolstadt
Supply Chain Management & Operations
Auf der Schanz 49, 85049 Ingolstadt, Germany*

Abstract

This article focuses on the tactical problem of selecting delivery patterns according to which grocery stores are repetitively supplied with products from different order segments by retail-owned distribution centers. The research environment considered consists of logistics processes in DCs, transportation and instore logistics. We identify dependencies on the delivery patterns selected and specify the relevant costs. These costs are reflected in the objective function of a binary selection model. Implementing and applying the model to the real case of a major European retail company yields substantial cost savings potential of 5.3%, amounting to tens of millions of euros per annum.

Keywords: Grocery retailing, store delivery, retail operations, planning interdependencies

*Corresponding author

¹Tel. No.: +49 841 937 21822, Fax: +49 841 937 21955, michael.sternbeck@ku.de

²Tel. No.: +49 841 937 21823, Fax: +49 841 937 21955, heinrich.kuhn@ku.de