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A conceptual framework to understand retailers’ logistics and transport organization – illustrated for groceries’ goods movements in France and Germany

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Abstract

The article proposes a conceptual framework for analyzing the key drivers for retailers’ transport demand more systematically. Certainly, a better understanding of the reasons behind the growth in transport demand is crucial in formulating effective measures to manage and reduce emissions. Regarding to retailer-led supply chains, analyzing the retailers’ transport demand and its key drivers seems to be indispensable. This issue is even more important on an urban scale as retailers, through in-house or outsourced logistics deliveries to points of sale, have a high share of urban freight transport.

The authors’ main assumption is that transport strategies are embedded, both internally with other non-transport strategies and also externally with the company’s environment. A classification of the environment in three layers is suggested:

• The macro-environment, which is linked to the competitive and regulatory framework of the retail industry. Furthermore, the consumption patterns of consumers are essential for the retailers within this layer.
• The meso environment refers to the retailer’s sectorial dynamic. It includes aspects such as the vertical integration of the distribution of the wholesale stage or new relationships with the suppliers e.g. through the development of own-brand products
• The micro environment is related to the strategy of the individual retailer and encompasses economic strategies (type of retail format, marketing area, size of the retail area etc.).

Furthermore, the paper illustrates the chains of interdependencies between the different layers of environment and their consequences for the logistics and transport organization, using the example of food retailers in France and Germany.

Key words: food retail, retail strategy, logistics and transport

Introduction

Transport-related emissions, especially of freight transportation, play an important role in the discussion about climate change. CO$_2$ emissions are increasing faster in freight transport than in other sectors, so that a strong need to reverse this trend is broadly acknowledged. Relevant effects may arise on different sides: The OECD concluded that some 40 percent of the effort necessary to meet the criteria for environmentally sustainable transport will come from technology and around 60 percent from demand-side management (1). Consequently, much of current transport and environment policy aimed at achieving environmentally sustainable transport will require demand-side rather than supply-side measures (2).

Indeed, even if it is assumed that the main cause of increased emissions is the growth in transport demand (3), the vast majority of actions to reduce the carbon footprint of the transport sector have been taken within the transport sector itself, e.g. expansion of transport infrastructure or technical improvements. These approaches are important but ignore the key drivers which create the demand for transport. To achieve a sustainable transport system and to initiate effective measures, an understanding of transport demand is first required (4). This understanding could be helpful to deploy a broader range of instruments to reach the goal of sustainable transport.
Any attempt to understanding what drives transport has to take into account the way firms organize their operations, the location of both production and distribution facilities, the sourcing of inputs and the serving of markets. However, detailed knowledge on the decisions made concerning the movement of consignments in the context of production does not exist (5). Following Rodrigue and Hesse (6), the fundamental question does not necessarily reside in the nature, origins and destinations of freight movements, but how and why this freight is moving.

Among these changes affecting transport demand, many studies put the emphasis on the changes from a supplier to a retail-controlled supply chain (4, 7). Other studies underline that particular transport growth occurs on an urban scale; the urban goods movements are the result of a set of choices made by customers, retailers, wholesalers, carriers and local authorities (5). Allen et al. (8) have pointed out that the demand for urban freight transport activity is derived from the demand for goods flows produced or consumed in urban areas. Another substantial body of research addresses the dilemma of environmental impacts and efficiency of urban freight transport, focusing on urban deliveries and retail logistics (e.g. 9, 10, 11).

Yet very little is known about retailers’ transport demand and its key drivers. Based on the question of how the influencing factors of retailers’ transport demand can be systematically grasped, the authors aim to provide a conceptual framework which allows analyzing systematically the key drivers for the retailer’s transport demand. Subsequently, an illustration of these key drivers for the food retailers in France and Germany is shown. As a conclusion, a scheme is presented demonstrating the general interactions between logistics and transport factors and the drivers that have been identified. Furthermore, a summary of the results highlights the dedicated links between specific factors. This can be the basis for a discussion on the policy instruments to tackle the problems of climate change and the environment beyond the transport sector.

**A conceptual framework to capture the complexity of influencing factors of retailers’ transport demand**

Freight transport demand may be understood as derived demand, resulting, however, from complex structures and processes. Transport activities are concomitantly planned with activities occurring at the origin, destination, and also at all intermediate stages to the extent that production, consumption and freight distribution are jointly considered and integrated transport demand is progressively replacing the traditional derived transport demand (12). Many researchers feel that it is more important to understand the system in which the company operates and the factors that determine its action. This question requires an understanding of what behavior is based on.

“What do we see upstream from the behavior of individuals? How do we see the formation of societal effects, and in particular collective objects, from the latter? The first question asks for the rationality of behavior: do we see rationality at the origin of behavior and if so, how do we conceive it? The second question asks for the perspective of a holistic view whereby societal wholes are not merely the sum of individual actions” (13). The main benefit of theories that address the origins of decisions is to adopt a conception of transport strategies as embedded, both internally with other strategies and also externally with the company’s environment. Several conditions must be met for a strategy to be viable. It must be possible for the company to implement the strategy (internal requirement). But this strategy must also be coherent (external coherence) and compatible with the macroeconomic context. While the company interacts with its national context, it also develops particular relations with its own sector. The
idea is to consider not only the macroeconomic influence on company strategy, but also that of the sector (14).

The authors followed this framework to classify the key drivers of retailers’ transport and logistics strategies. In the following, first the retailers’ transport and logistics strategies are described before presenting their key drivers which were differentiated between three categories which at the same time represent macro, meso and micro levels of key drivers (4). The result is a theoretical scheme and a conceptual framework about the decision-making process for retailers’ transport and logistics strategies. Subsequently, the scheme will be tested and applied to the food retail sector in France and Germany.

Grasping retailers’ transport characteristics

The transport organization of a company is always prejudiced by logistics decisions aiming “to move product efficiency along the supply chain” (15). The characteristics of retailers’ transport are conditioned by the organization of its transport and logistics, which differ from company to company. The characterization of transport and logistics organization can be described by taking different indicators related to three possible dimensions: the physical transport operations (transport features), the physical activities and the material and immaterial assets:

- Physical transport operations become more and more integrated into complex logistics systems. Beyond transport operations, strictly speaking, transport firms also deliver various services of management of flows, input to (and sometimes also management of) information systems, co-packing, co-manufacturing etc. Freight transport operations have become more and more complex and differentiated over the past 30 years. Beyond shipping and handling goods, they often include operations such as the treatment of information flows, the differentiation of goods for the final customer etc. The conceptual representation of freight transport exclusively in terms of flows of goods thus becomes less relevant to the realities of the freight transport sector. That is why the description of the logistics services has to be associated with the transport indicators (16, 17, 18).

- Logistics and transport services can also be described in terms of physical activities (e.g. transport, storage) as well as non-physical activities, related to the organization modalities of these physical activities (e.g. supply chain design, selection of contractors, freightage negotiations) (19).

- These logistics and transport activities rely on material and immaterial assets: the transport fleet, the development of retailers’ regional distribution centers (centralization or decentralization of the warehousing), or the use of information technology systems (e.g. EDI, EPoS (20)). Fernie and Sparks (21) identify these assets as key components for retailers’ logistics and transport strategies. For example, retailers manage warehouses or distribution centers to enable them to keep stock in anticipation of or to react to sudden changes in the demand for products. Retailers have also become increasingly concerned with being able to capture data at appropriate points in the system and to use that information to have a more efficient and effective logistics operation (21).

Several indicators can be assigned to these dimensions for logistics and transport strategies. Among these, it is possible to classify influencing factors found on the micro, meso and macroeconomic levels, which
are not directly related to transport. Rather, the organization of transport is derived from these non-transport-related factors (4).

**The non-transport-related drivers**

It is possible to distinguish the retailers’ logistics and transport environment on three different levels (macro, meso and micro) which are primarily economic but include spatial elements. The differentiation follows approaches, among others, of Boyer and Freyssenet (21), Freyssenet (22), Dopfer et al (23) as well as Jullien and Smith (24):

The macro-economic factors are related to the competitive framework and represent retailers’ upstream influences. So, for instance, demands of new social and regulatory requirements on the one hand and consumer concerns over ethical sourcing and environmental issues on the other may drive a need for proactive management by the retailer on all aspects of product “traceability”. The macro level represents only company external factors.

Following Jullien and Smith (24), factors of meso-economic strategies refer to the sectorial dynamics around relationships with four principle partners: clients, suppliers, investors and employees. The development that retailers are further pushing for control to even earlier stages within the supply chain to break down all cost components also plays a role here. Taking on the procurement and seeking visibility of product costs help to drive down costs and leverage component parts across products.

As far as micro driving factors are concerned, the French regulation theories have focused on the identification of profit strategies of companies (21, 22). The respective analytical framework identifies six fundamental sources of profit: volume, quality, diversity, flexibility, innovation, and constant cost reduction. The possibility to implement the strategy can be analyzed along three major components: product policies, production organization, and employee relations.

For trade-related transportation, these sources of profit and internal requirements raise the following main questions:

1. Which products are sold?
2. Which marketing strategy is used? How is the product offer kept fresh and attractive to ever more discerning customers?
3. Which type of shops or network of shops is chosen? Which are the trading formats?

The operationalization of this socially embedded conception of logistics and transport strategies is described with the below scheme shown (Figure 1) which provides a representation of the complexity of the decision-making process for the retailers, as far as transportation is concerned.
To test the applicability of the concept, the authors conducted a study for the food retail sector in France and Germany. This study was based on a literature survey and qualitative interviews and examined the interdependencies between the strategies on different levels, and the impact on logistics and transport organization. It was expected that both convergences and divergences between the two countries could be observed depending on the power of the different factors.
Methodology

Food retail is difficult to assess because it is not captured in a specific statistical category. All in all food retail refers to four statistical categories: “retail trade in non-specialized stores”, “retail trade in specialized stores”, “retail trade not in stores via stalls and markets“ and “other retail trade not in stores”. Looking at “retail trade in non-specialized stores” in Germany around 91 percent of the turnover concerns “retail with food predominating”; for France even 96 percent can be recorded. Retail trade of food, beverages and tobacco represents nearly 50 percent of the turnover of the total retail trade in France and Germany: 47 percent for France and 42 percent for Germany in 2010 (25). In 2008, some 20 percent of all retail companies were associated with food retail (22 percent for Germany, 19 percent for France).

In order to derive information about the logistics and transport strategies of food retailers and their links to the economic environment on different levels, about 56 interviews were conducted with different actors in the supply chain (see Table 1). The interviews, conducted in France and Germany, were held in the period from January to April 2012. The questions were related to the following topics: gaining knowledge about the interviewed company, their (choice of) geographical locations, their relation to other supply chain actors, their overall activities, their assortments, and their used physical assets.

The interviews held face-to-face and via telephone were based on a guideline which was sent out to the interviewees before. With the interviews, the full range of food retail formats i.e. hypermarkets, supermarkets, discounters and others were covered.

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Wholesaler</th>
<th>Retailer</th>
<th>Service providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>3</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

TABLE 1 Conducted qualitative interviews with food actors in France and Germany

In the following selected findings from the interviews and literature review are presented according to the concept outlined above.

The macro environment of food retailers

The micro and meso environment of retailers is often impacted by public policies. Consumption patterns play another big role. Through the conducted interviews, we found that consumption patterns influence not only the products offered at the point of sale, but also have an influence on the chosen suppliers. One example is the increasing demand for regional products: changing the assortment towards more regional products often results in a stronger involvement of regional suppliers. Dawson (26) suggests that “changes in consumption are related to long term changes in income and price elasticity and short term advertising campaigns, but there are also broad shifts in demand which represent changing social attitudes to products.” Assortment or product adoptions frequently result in changing network structures and consequently also the retailers’ transport and logistics organization. Changing consumer needs and trends can also be related to changes in population, such as demographic change.

Looking at the role of regulation which directly impacts the retailers’ macro environment, one of the most important aspects are rules for land use: In Germany, in most urban areas, excluding central and special areas, shops are limited to a maximum area of 1,200m², i.e. a maximum sales area of 800m². All food retailers who strive for bigger sales areas must prove that this will not have negative effects on
central shopping areas (§ 11 Abs. 3 BauNVO). As discounters’ sales areas normally fall below this, they are favored by this law. Legislation in France limited the number of new hypermarket and supermarket openings in 2006 which prompted large stores to expand existing surface area. Complaints that this new measure benefitted existing hyper-/supermarkets resulted in a modification in July 2008, included in the “Loi de modernization de l’économie” (LME), which allowed the opening of new stores under 1,000m².

The meso-economic environment of food retailers

The retailers’ integration of the wholesale stage and new relationships with suppliers through the development of own-brand products are the two most important characteristics of the meso environment of food retailers. This is linked to the retail format and the development of big retail groups and has an influence on the procurement volumes and the type of logistics organization through distribution centers.

Two main trends can be observed in the food retail in France and Germany: the change to retailer-led supply chains and the integration of the procurement and wholesale stage by the big retailers. Cost reductions are achieved by eliminating the role of the traditional wholesaler through direct supply from primary producers and manufacturers to regional distribution centers (RDCs), and then on to supermarkets. Only for fruits and vegetables do traditional wholesalers still have an important position. Another cost saving strategy, of discounters in particular, is cutting down storage time through just-in-time delivery from the distribution centers to the points of sale for almost all products.

On the other hand, the bargaining power of retailers is increasing due to the merging of retailers to retail affiliations, consolidations at international level and the growing importance of private or store labels. In most of the mature EU15 retail markets, the eight biggest companies accounted for between 50 and 80 percent of the national grocery retail market in 2007. Procurement costs are reduced by extracting more favorable terms from suppliers. This is supported by the emergence of retailer-owned brands oriented towards the lower price segment. In France, for instance, the “private label” sales reached 31 percent of all food product retail sales in 2008. Added to this is the increased production of meat and sausage by the retailers themselves and the direct delivery from the production site to the point of sale so that we find an entire process chain. The interviews showed that meat production locations may function as a distribution center for other products, too, in particular for convenience foods like prepared salads or sushi.

Micro-economic strategy of food retailers

Strategies concerning the retail format, the sales area and the marketing policy are the most important ones for food retailers. But there are differences between France and Germany that lead to variation in the volume and frequency of deliveries in particular.

In the grocery sector, two new formats were developed in both countries. One was the hypermarket (e.g. Auchan) in France, the other was the grocery (hard) discounter (e.g. Aldi) in Germany (27). Hard discounters traditionally offer a range of 600 to 700 products, with a high share of own brands, at low price and ultra-low margins. The market concentration reinforces the domination of these two formats (28); discounters had about 16,200 points of sales and a market share of 35 percent in Germany in 2011 (29). But in both countries, we observe a saturation of the markets for these traditional formats. This situation leads to market adaption: hard discounters widen their assortment by selected brand products. Other retailers use the strategy of market segmentation by introducing store types that are mainly differentiated by size, assortment and price segment (see table 2).
### Table 2: Examples for retailers’ market segmentation

<table>
<thead>
<tr>
<th>Example for France</th>
<th>Example for Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrefour (selected company type)</td>
<td>Rewe (selected company type)</td>
</tr>
<tr>
<td>Carrefour (large scale supermarket up to 20,000m²)</td>
<td>Rewe (full range supermarket)</td>
</tr>
<tr>
<td>Champion (full range, &gt;1000m²)</td>
<td>Rewe Center (full range, big department store)</td>
</tr>
<tr>
<td>8 à Huit (fresh food, convenience, small scale 70-400m²)</td>
<td>Rewe CITY (full range supermarket up to 1000m² in cities and at airports &lt;1000m²)</td>
</tr>
<tr>
<td>Dia (hard discount, 500-800m²)</td>
<td>Nahkauf (shop around the corner, small scale)</td>
</tr>
<tr>
<td></td>
<td>Rewe to go (focused on convenience)</td>
</tr>
<tr>
<td></td>
<td>Penny (discounters)</td>
</tr>
</tbody>
</table>

These formats influence the retailers’ marketing policies. Hypermarkets develop a “services” policy whereas discounters focus on a margin policy. The high sales volumes and low store and personnel costs which discounters generated through a limited range of assortment and minimal store fittings allowed for low trade margins. With average profits reaching only 0.8 percent of sales in West Germany – down from 3.4 percent in 1970 – and 0.5 percent in the poorer Eastern part of the country, Germany’s retail industry is probably the least profitable of the whole industrialized world (30). Returns are particularly meager in the food segment – at 0.5 percent of turnover, compared to 5 percent in the UK and 3.5 percent in France.

Another typical difference between the two countries is the fact that the average sales area per supermarket is smaller in Germany than in France. As the interviews indicated, this is closely related to the different format of the stores. The surface for food sales per inhabitant, however, is 0.47m² in Germany and only 0.37m² in France. Further investigation is needed to understand the reason behind this difference.

Summarizing our observations we find interactions between the micro-economic framework of retailers’ strategies and their environment. The macro environment, above all public policy, has an impact on the retail format and on the relationships with the suppliers. However, the unbalanced structure of the distributive supply chains also explains the genesis of this last, public form of regulation. The meso environment is closely linked to the retail format and retailers’ marketing policy. All these elements and interdependencies have consequences for the logistics and transport organization of retailers.

### Consequences on the logistics and transport organization of food retailers in France and Germany

In the following, the logistics consequences of environmental structures will be described and their impacts on transport discussed.

#### Logistics consequences

Logistics plays a fundamental role in supporting retail companies in rationalizing their distribution infrastructure and making more efficient use of their resources. Consequently, logistics has emerged as a key business operation to enhance a company’s competitive advantage via improved customer service and lower costs (31).

The changes of the environment on the meso level are closely linked to the development of central sourcing through buying offices and to the emergence of large distribution centers. Control of the supply chain has passed to the large supermarkets and hypermarkets. This development has led to a
restructuring of the procurement systems of supermarkets, based on central sourcing. Supermarket chains have been shifting away from the old procurement model based on sourcing products from the traditional wholesale markets, toward the use of new procurement systems (32).

In France, mergers and alliances among major hypermarkets and supermarkets have aligned the country’s five largest retailers with seven central buying offices. These buying offices usually also undertake tasks like sourcing products, handling import and customs formalities, logistics, supply, maintenance, delivering and sometimes pricing and labeling for their retail customers. Only a few major food retailers buy directly. In Germany each leading retail group has a different business structure, purchasing, and distribution system. The purchasing departments for the large retailers are often divided by retail format and, sometimes, by region of the country. Buying associations or groups also play an important role in German retailing. They are often operated by a wholesale company which does the purchasing and marketing, and provides other services for independent retailers (30).

Another important change is centralized procurement through Distribution Centers (DCs). As a result the number and size of wholesalers’ warehouses is in decline, which also leads to a consolidation of stocks at a reduced number of very large regional DCs, controlled by the retailers but often operated by a Third Party Logistics Manager (33). These distribution centers are mostly located along motorway corridors. At the same time changes in logistics practices are favoring the development of distribution centers based on cross-docking, with only small amounts of warehousing (33). Following Lamey (34), it seems that the centralization of retail logistics operations at European level has reduced transport, warehousing and inventory costs by an estimated 40-50 percent overall. At the beginning, the implementation of centralized deliveries aimed at three dimensions: reduced costs, improved customer service and faster reactivity to changes in demand. Under the pressure of increasingly demanding and volatile consumers, the large French food retailers especially ended up favoring the last two dimensions (35). The extent to which food retailers reorganize their distribution networks by rationalizing the number of distribution centers and establishing composite warehouses (i.e. large warehouses that hold more than one product category) tends to depend on the number and type of the retail outlets operated.

The interviews showed that differences in retail logistics organization are closely linked to the retail format. For example, logistical costs for hypermarkets and supermarkets increased throughout the 1990s, particularly with an improvement in delivery systems to reduce the number of stock outs in outlet. This also resulted in a greater product variety (36, 37). Currently, the main problem of large French food retailers is that they manage several retail formats, unlike the two German hard discounters Lidl and Aldi, who manage a single retail format. But separation in terms of logistical choices can also be observed in Germany, as discounters and full range assortment warehouses have different requirements. Rewe Group, which owns the discounter Penny and Rewe supermarket, separated their logistics organization and warehousing in 2012 to optimize their processes according to the different requirements of the organizations.

**Transport consequences**

Most products have to be transported in some way between production and consumption. Retailers therefore have to manage a transport operation that might involve different forms of transport, different sizes of containers and vehicles and the scheduling of drivers and vehicles (38). Looking at inbound transportation, retail distribution remains a significant contributor to road congestion and infrastructure costs. Our interviews confirmed that attempts to shift retail transport from road to rail have mostly been unsuccessful (33). The main recorded changes in transportation tackle the outbound. There are smaller,
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more frequent deliveries to stores, combined with longer shop opening hours, which is increasing vehicle movements faster than retail turnover. The extensive use of IT enables an optimization of the delivery patterns. Carrefour, for example, went from about 80 trucks per day delivering from 2,500 suppliers, to their RDCs and hypermarkets currently each receiving deliveries from ten trucks per day.

Usually changes in logistics structures affect transportation, as when stock holding is centralized into fewer, larger distribution centers. Transport distance increases and place higher demands on transport in terms of delivery reliability. Since the cost of transport is often low compared to the cost of storage and stockholding, a more centralized DC strategy has generally resulted in cost savings for retailers (37).

The results of the interviews and the literature demonstrate the complexity of the decision-making process for the retailers as far as transportation is concerned. Transferred to our general scheme the following figure can be drawn (Fig.2):

**FIGURE 2** Findings for food retail in France and Germany, based on “decision-making concept”

**Synthesis and conclusions**

Our findings show that the organization of logistics and transport in food retail is influenced by various framework conditions that can be allocated to different levels of its environment: the micro, meso, and macro. Furthermore, the interview results allowed the derivation of specific indicators that have an influence on retailers’ transport and logistics organization, taking for example the days of storage which are strongly influenced by the type of product and the type of format of the retailer. Differences in the interviewed companies’ logistics organizational structure could be mainly ascribed to the retail format
(supermarket, hypermarket, discounter, hard discounter), the range of assortment and the type of products offered at the point of sale. Retailers’ spatial warehousing policy and the type of logistics services used depends on whether they belong to a group or affiliation as well as their type of retail format. Looking at transport operations, the type of retail format and the offered type of products are among the main influencing drivers. The point of sale itself has the most important influence: the location within the town or city, the geographical distribution as well as the distance to the DC/RDC determine the nature of the transport. The identified indicators of logistics and transport, and the factors which have the strongest influence on them are summarized in tables 3 and 4:

**TABLE 3 Indicators of logistics**

<table>
<thead>
<tr>
<th>Indicators of logistics and their key drivers</th>
<th>Key drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days of storage</td>
<td>Type of product, Type of retail format</td>
</tr>
<tr>
<td>Number of warehouses</td>
<td>Type of product, Range of assortment, Type of retail format, Geographical spread of point of sales, Belonging to a group or affiliation</td>
</tr>
<tr>
<td>Spatial patterns of the warehousing policy</td>
<td>Geographical distribution of the point of sales, Type of retail format, Belonging to a group or affiliation</td>
</tr>
<tr>
<td>Share of outsourcing</td>
<td>Type of retail format, Type of logistics services</td>
</tr>
<tr>
<td>Type of logistics services</td>
<td>Retail policy (rotation of the products and costs), Type of retail format</td>
</tr>
<tr>
<td>Use of SCM tools</td>
<td>Type of retail format</td>
</tr>
</tbody>
</table>

**TABLE 4 Indicators of transport**

<table>
<thead>
<tr>
<th>Indicators of transport and their key drivers</th>
<th>Key drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies</td>
<td>Type of retail format, Location of point of sales</td>
</tr>
<tr>
<td>Service performance</td>
<td>Retail policy (assortment priority and rotation of products vs costs)</td>
</tr>
<tr>
<td>Deliveries</td>
<td>Type of products/product groups</td>
</tr>
<tr>
<td>Outsourcing</td>
<td>Retail size-format, Status (group or affiliations), Distance from warehouse to point of sales</td>
</tr>
<tr>
<td>Load rate /Load volume</td>
<td>Type of retail format, Size of sales area point of sales (Type of truck)</td>
</tr>
<tr>
<td>Size of the tour</td>
<td>Type of retail format, Size of sales area, Location of point of sales, Distance to DC/RDC</td>
</tr>
<tr>
<td>Transport modes (Inbound)</td>
<td>Type of products, Origin of the products, Distances from supplier to warehouse</td>
</tr>
<tr>
<td>Type of trucks</td>
<td>Type of products</td>
</tr>
<tr>
<td>Transport costs</td>
<td>Type of product</td>
</tr>
</tbody>
</table>

Overall we could demonstrate how sales related strategies of retailers influence logistics and transport, and based on our empirical findings for the food retail in Germany and France we were able to allocate relevant factors and key drivers to our conceptual framework. The results underline that for an
understanding of transport (demand) a systemic view that is going beyond logistics and transportation is needed.

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References


