

The effects of home delivery on access to food products: the case of supermarkets and cybermarkets in the metropolitan area of Dijon (France)

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INTRODUCTION

The population's ease of access to supermarkets³ varies across geographical space. Whereas the urban population of city centres has a diversified supply within walking distance, periurban and rural populations have to drive several kilometres to their nearest supermarket (Motte-Baumvol 2008). While this is no problem for the vast majority of the periurban population, it is more difficult for some, such as household without cars, the elderly, or families with young children. For these families home delivery, especially through online sales, may improve access to an assortment of food products by eliminating travel-related difficulties. In this context home delivery is a form of distribution that can transform the framework of analysis of the population's access to shops, especially in the outer suburbs.

Home delivery is a service proposed by supermarkets either via online shopping or after shopping in the store and consists in transporting the goods purchased to the customer's home. It is currently difficult to estimate the turnover generated by such services but it is supposedly very low. One reason is that, nationwide, online shopping in cybermarkets is not a widespread practice. Turnover for the AuchanDirect cybermarket, for example, is reported to be just 45% of that of any single one of the company's hypermarkets.⁴ The other cybermarkets allegedly have even lower turnovers. Moreover, with the development of pick-up point systems, online purchase of foodstuffs does not necessarily entail home delivery. Another reason is that few data are available for the home delivery of in-store purchases. But it is thought that, currently in France, most customers go to the store to do their food shopping and take it home themselves (Ranvier and Sury 2009). Home delivery of grocery products from online or in-store sales is only aimed *a priori* at a minority of households and individuals. Murphy (2007) sees six customer segments that use home delivery from online sales, and those segments may also be relevant for in-store sales: households without cars, people with decreased mobility or the elderly, families with young children, customers looking for specific or organic products that cannot be found in every supermarket, people who work long hours or who have very active social lives, and technophiles. For the first three customer segments, home delivery of online or in-store purchases is a service that can indeed free them from the biggest constraints in terms of transport and geographical accessibility. For the other three types of customers, transporting and handling their purchases do not seem to be a big issue. Based on this typology, demand for home-delivery could rise in the future. Several socio-economic changes suggest this: development of Internet use and growing adoption of online shopping, ageing of the population, and sustainment of a high fertility rate.

Even if the share of the population liable to take advantage of home delivery for reasons of transport and accessibility is small, the question of social equity and of servicing all areas of the country is central to regional development policy in France. In particular, the question of amenities and of the provision of services or shops in certain areas, especially in the outer suburbs, is a recurrent concern for elected officials and their citizens. Yet this question has been little discussed and is only a

³ Super/hypermarkets (Grandes Surfaces Alimentaires) (INSEE 2010) include all non-specialist or generalist retail establishments of more than 400 m² that make some part of their turnover from food. They typically have a range of food products, but also a variable range of non-food products.

⁴ Auchandirect company accounts 2008.

background issue in studies on the environmental impacts of home delivery as a mode of delivery for remote selling (Cullinane 2009, Cairns 2005). The Internet has often been thought of as a means to eliminate distance (Cairncross 1997) and to promote urban sprawl (Shen 2000). Applying this reasoning to online purchases of goods in general and of foodstuffs in particular would be to forget that the purchasing process can be made electronic in part only, and that it may therefore have potentially multiple effects on the spatial organization of shopping, ranging from the reinforcement of peripheral or central areas to the emergence of finer coverage of the territory (Rallet 2001). Does delegating these stages in the purchasing process (order preparation and/or delivery) to distributors increase the access of geographical areas, and especially of the least densely populated areas, to food products? Some distributors readily assert this: 'online shopping, whether you live in the city or in an isolated rural area, is now possible with Placedumarché.fr, the new shopping website that delivers to your door' (company website in 2011). This assumes that distributors serve all types of areas equally. Confirming this point involves looking at the areas actually served by companies offering home delivery.

This study is based on a specific area, the metropolitan area of Dijon. A survey of the supply side and interviews of the leading actors in home delivery for supermarkets and cybermarkets, their online equivalents (Ranvier and Sury 2009), reveal that home delivery is barely developed and still stuttering. Being spatially concentrated in the centre of the metropolitan area, the delivery areas tend to further favour urban populations living close to supermarkets to the detriment of populations in the outer suburbs. Moreover, with their limited time slots, unattractive service charges, and lack of advertising, some delivery services target a small customer base so as to avert an explosion in costs for those distributors who do offer home delivery. Conversely, other companies would like to target a wider customer base over wider area. But they are probably held back by substantial logistics and operating costs for want of the necessary investment which is too high for the size of the Dijon market.

DEFINITIONS AND METHOD

Supermarkets and cybermarkets

Supermarkets offer a range of foodstuffs falling into three main product types: ambient, refrigerated, and frozen. This study looks exclusively at distributors providing all three types of products. Offers for specialized foodstuffs proposing only frozen foods, fresh fruit and vegetables, or dry goods are omitted. They do not fit in with the usual household shopping, which by a massive majority uses supermarkets as the main source of food supply. In 2010, supermarkets had a 66.6% market share of food retailing (Bras et al. 2012). Moreover, using specialized distributors would require most households to make an extra effort for their supply by multiplying sources and modes of distribution.

On the Internet, it is easy to identify distributors offering a combination of ambient, refrigerated, and frozen foods. They are commonly referred to as cybermarkets or 'e-grocers'. In France, most of them are the big retail companies with brick-and-mortar stores. These cybermarkets are 'click and mortar' or 'bricks and clicks' ventures in that e-shopping is an additional outlet supplementing the company's physical points of sale. In the cybermarket sector in France, there are no longer any 'pure players', that is, distributors for whom the Internet is the only outlet. Although companies distinguish or may sometimes distinguish their cybermarkets from their brick-and-mortar stores by using different

names, their web pages make it clear which companies own which e-grocers. This visibility provides distributors with an advantage in terms of their image: it ensures customers a certain level of service, and a range with a number and diversity of products similar to what can be found in the physical stores. The cybermarket offer is very diverse and matches that of a supermarket given the size of their product range, which lies between 6500 and 50 000 products (Durand 2008; Dumans and Chambolle 2002).

Data collection on home delivery in the Dijon metropolitan area

First of all, for cybermarkets, their Internet sites were the main sources of information on supply in the Dijon metropolitan area, their geographical coverage, delivery time slots, and service charges. For the offer in terms of stores and of home delivery for in-store purchases, we used several sources and methods of data collection. First we used the 'Atlas de la distribution 2010', published annually by LSA (Libre Service Actualités) magazine, a specialized business journal for supermarket distribution and consumption. The Atlas was used to identify the company, and the size and location of each store. However, it does not indicate what in-store services are proposed, such as home delivery. The websites of the various companies provided detailed information on home delivery after in-store purchase, especially for times, service charges, and delivery areas. In 2011, the information of the two sources was confirmed and supplemented by visits and telephone calls to the various distributors in the metropolitan area. Finally, trips to several supermarkets provided the opportunity to observe how the stores communicate about home delivery and include it in their sales armoury.

Interviews

The second stage of the field work was to conduct interviews to supplement the knowledge available about supermarket deliveries in the Dijon metropolitan area. These semi-directive interviews of store managers and local delivery service providers were designed to determine how home delivery operated and was organized. The aim was to determine how long and why home delivery had been proposed, what the target customer segment was, and above all which customers used home delivery. For those companies where it was still not clear, these interviews made it possible to identify the area they covered by deliveries and the criteria they used in defining it.

The first interviews were with the Géant Casino store in Fontaine-Lès-Dijon and its service provider Maxi'M Service. The second store chosen for an interview was Super U in Chenôve. This store proposed home delivery at one time but no longer does so. The delivery manager of Monoprix in Dijon was also interviewed. This store was chosen as it is located in the city centre, it offers online and in-store sales, and it delivers further afield than within the city limits of Dijon, over a large part of the metropolitan area. An interview was conducted at the Intermarché Port du Canal, which centralizes all deliveries from Intermarché stores in and around Dijon (7 stores). The service provider for deliveries from Super U in Talant was also interviewed. This is a one-person business with an unwritten agreement with the store that allows her to make deliveries to the supermarket's customers. The delivery is therefore neither arranged nor proposed by the supermarket staff.

RESULTS

Little home delivery in the Dijon metropolitan area

In May 2011 the Dijon metropolitan area had some sixty supermarkets, one in four of which were located within the city of Dijon. Half are located in the other districts of the urban core. These districts are either contiguous to Dijon and/or located along the agglomeration's three main radial roadways. The other supermarkets are located on the River Saône plain (south-east of Dijon), where population densities are highest, around the districts of Genlis and Brazey-en-Plaine. To the west and north, there are practically no supermarkets. Accordingly, these stores are highly concentrated spatially: of the 214 districts of the metropolitan area, only 21 (10%) have a supermarket. This concentration reflects the population since 74% of the population and 79% of households have a supermarket in their home district.

The 60 stores the Dijon metropolitan area belong to 15 different companies, almost one in three being hard discount stores with lower prices and fewer services. While many companies are present in the geographical area under study, the supply of online foodstuffs remains limited. Whereas all of the main French supermarket companies have online shopping sites, only three of them make deliveries in the Dijon metropolitan area. None of the leading cybermarkets propose this service locally. They leave the field to secondary actors in online shopping: Géant Casino, Intermarché, and Monoprix. This situation is the direct result of the different logistical arrangements of the cybermarkets, which rely either on order preparation in dedicated warehouses (a single warehouse with de-grouping platforms or local warehouses for order preparation), or on in-store order preparation (Gavaud 2010). The leading companies like Carrefour, UTélémarket or Auchandirect prefer dedicated logistical organization around automated warehouses from which distribution is carried out. This 'in-warehouse picking' model cuts down on logistics and order preparation costs. But it requires sizeable investment and is only warranted if the business exceeds several hundred orders per day (Koster 2002). Conversely, for secondary actors, the 'in-store picking' model as initiated by Tesco, a major British supermarket, has become predominant (Murphy 2007). This form of organization requires less investment, corresponds to a relatively low turnover, and can be rapidly deployed from an existing network of stores: it is therefore better adapted to small markets and distributors (Brousseau and Kessous 2003) such as the Dijon market. However, the unit cost per order is higher because a picker is required to take the products from the supermarket shelves. This activity may disturb customers doing their shopping and drive them away (Ogawara et al. 2003) and it may prove expensive in supermarkets with a large number of products (Brousseau and Kessous 2003).

More than order preparation, home delivery represents a high cost for cybermarkets. It is no longer the customers who take charge of the final transport for the 'final kilometre' but the sellers (Rallet 2001; Li and Yousept 2004; Augereau et al. 2009). Now, this cost cannot be passed on in full to the customer: the customer is not prepared to pay high delivery charges for low-value products like foodstuffs (Rallet 2001). When it is the sellers who must cover the transport costs, they seek to minimize them. But home delivery involves transporting small quantities with a multi-temperature van to widely dispersed destinations. Moreover, home delivery is subject to many vicissitudes such as congestion, parking difficulties, or access to certain types of housing, as well as customer absence (Gratadour 2001), all of which push up delivery costs. This is why cybermarkets are increasingly opting for other logistic arrangements, namely collection of online orders by appointment directly from the stores or from a pick-up point, that is, a warehouse on a shopping estate (Gavaud 2010). For online sales, the collection of shopping from the store represents a 70% saving for the seller compared with home delivery (Durand 2010).

The costs inherent to home delivery also arise for those supermarkets that propose home delivery for in-store purchases by customers. Although preparation costs are lower, the costs of transporting the purchases are identical, or even higher (orders than cannot wait before delivery and more complex pooling of deliveries). It is understandable, then, that home delivery of in-store purchases is not widespread. For the entire Dijon metropolitan area, only seven supermarkets propose home delivery for in-store purchases outside of the very centre of the city. This zone enjoyed home delivery services operating within a limited radius, generally not exceeding the boundaries of a neighbourhood. These stores belong to companies that also propose online shopping in the metropolitan area, namely Géant Casino, Intermarché and Monoprix. Thus these companies have integrated management of the home delivery services for online and in-store shopping. The aim is to achieve scale economies and to optimize resources. Intermarché has the most closely integrated form: while six of the company's stores (out of seven in the study area) offer home delivery, there is just a single delivery service for all the store and for online sales. The service is in-house and does not outsource the delivery of purchases. The Port du Canal store manages and organizes deliveries for all of the Intermarché stores in the area and it also proposes collection from the store of online orders, even if it does not have a pick-up service. Although the Monoprix organization is more complex (just one store in the metropolitan area), the company uses the same integration strategy as Intermarché, except that the service has been outsourced. This integration of the different shopping functions (online and in-store) illustrates the emergence of hybridization (Rallet 2001) or of a multi-channel (or even trans-channel) strategy by these companies (Moati 2009; Poirel and Fernandez 2008).

Aside from these integrated forms, two more unusual cases occur in the Dijon metropolitan area. The first concerns Géant Casino. The store in Chenôve in the south of the agglomeration is the distribution point for the company's online sales whereas only the store in Fontaine-Lès-Dijon offers home delivery for in-store purchases. It seems that the store in Chenôve does not wish to offer a home delivery service for in-store shopping. The Fontaine-Lès-Dijon store is not necessarily any keener to provide this service, which is not even advertised on the company web site. And yet Maxi'M Services provides this service as part of an already long-standing agreement. The store has made little if any commitment to the service, since neither the company logo nor the name ever feature on the promotional material (flyers and brochures), the delivery van, the delivery staff uniforms, or the delivery documents. For the store, no thought has gone into including delivery in the commercial policy, to the extent that the service provider offers to prepare orders placed by e-mail or by telephone. The service provider is thus in direct competition with the company's online sales run by the Chenôve store. The second and more original case of a non-integrated home delivery service between in-store and online sales is provided by a self-employed home-help. She helps people to do their shopping by accompanying them or doing the shopping for them. After accompanying people several times to the Super U store in Talant, she asked permission to leave a notice in the store offering her shopping delivery services, which was granted. She stated in the interview that she was ready to provide the service in any of the supermarkets in the Dijon metropolitan area.

In short, home delivery of food purchases from supermarkets (in-store or online) is little developed in Dijon and its surrounding area. Only a few companies specialized in in-store picking have moved into the sector. Three of them have opted for integrated management of home delivery of their products. This may be viewed as the outcome of a more or less consistent policy within a group that owns the supermarkets or of a series of franchised stores under the same ownership. These stores have

achieved the critical mass to offer such a service and amortize the associated costs. For Super U, the store owners are associated in a regional cooperative. Ten of the company's stores are located in the metropolitan area with seven different owners. As they have different turnovers and customer areas, it is probably difficult for them to propose an integrated service. In the absence of a strong corporate policy in this field or of the critical mass to propose the service, duly identified outside service providers propose the service to consumers and are paid by consumers. The stores in which these providers are the most prominent are those that do not provide home delivery themselves and that therefore benefit from this additional service without having to invest in it. The interviews and field observations clearly show that this partnership is essentially tacit and fuzzy, being the outcome of informal local arrangements. The service therefore seems to be fragile and its continuation is not ensured.

Home delivery as a service for closely targeted customers

Although the supply for home delivery in the metropolitan area is limited, before determining the geographical coverage and the impact of this service on accessibility to food products in the area, it is important to understand what customer base the distributors are addressing. Depending on the populations concerned, some areas would seem *de facto* to be better served than others. In the case in point, home delivery (of in-store or online purchases) is part of a service strategy introduced by companies and aimed at several target audiences, namely dependent persons and families with young children. When questioned, the actors of home delivery in the Dijon metropolitan area designated the elderly and/or people with decreased mobility as their main target for supermarket delivery. Although these households are among the main users of home delivery services, they use home delivery for in-store purchasing, which is an important component in their social lives (Barth and Anteblian 2010). The proportion of such customers among online purchasers could not be determined, but it is in all likelihood low or even non-existent. This assumption is made from the result of other surveys in France and abroad reporting that the elderly purchase little on line (Berret 2008) because computer use and so Internet use is lower, although steadily growing, among the older age groups (Bigot and Croutte 2011). After the elderly, households without cars are the main users targeted for home delivery in Dijon, as an alternative to frequent and regular shopping trips or to the difficulty of transporting a large quantity of products. These two segments (which may overlap) are the primary targets of service providers like that of the Super U store in Talant. That provider proposes a home-help service rather than a goods transport service. It is primarily for caring for the dependent and disabled in the context of care in the community. In the context of this tacit partnership agreement, the Super U store in Talant wins out because the service is proposed in its store without the store having to finance it. In this instance, the consumers and government pay for it through cover for dependent persons.

The other main category targeted is young families who are both leading users of online purchasing and targets for home delivery of in-store purchases because, as a rule, they buy larger volumes than other categories of household. Monoprix plainly makes them one of its primary targets. For this store, located in the heart of the city of Dijon, a large proportion of its customers walk to the store or have small volumes of shopping. Home delivery is designed to win over families living in the city centre and currently travelling out to the supermarkets on the outskirts for their shopping as they can be more readily reached by car and larger volumes of shopping can be bought. The home delivery charge falls as the cost of the order rises, whether for online or in-store purchases, so as to

provide an incentive to households with children to purchase larger quantities. Other actors in the Dijon market apply different pricing policies to encourage delivery in large quantities. For instance, Intermarché has a flat rate for home delivery, whatever the cost of the order or the distance away, which is an incentive to order large volumes of goods rather. For the outsourced providers at the Géant Casino in Fontaine-Lès-Dijon and the Super U store in Talant, delivery charges rise with the volume carried, especially for packs of drinks. A day of hands-on observation (monitoring deliveries) with the service provider for Géant Casino in Fontaine-Lès-Dijon (in-store purchases) showed that customers were never asked to pay surcharges. Higher and/or fixed charges for home delivery are applied when the stores offering the service are not at the source of it and do not make it into a development instrument. This tendency to encourage delivery of large volumes so as to make scale economies shows that delivery services target large households and therefore families with children.

Delivery times also determine the customer base targeted and for which the services are most suitable. For example, for the Intermarché stores, home deliveries may be made throughout the week up to 5.30 pm at the latest. These time slots mean that a broad customer base cannot be targeted and they are aimed primarily at the elderly or those not in work. For households where both parents work, and especially those with children, these time slots are less compatible with their time constraints (work and school hours). Accordingly, Monoprix and Géant Casino have delivery slots up until 9.00 pm on weekdays and Saturday deliveries, too. Although the time slots are more extensive, some companies proposing online shopping tend to encourage collection from the store or from pick-up points for this type of customer. For Intermarché (collect from store) and Géant Casino (pick-up point), orders can be collected daily from 9.00 am to 7.00 or 8.00 pm, thereby providing for more scope than with home delivery. The companies look to have it all ways. With online sales, for households where both parents go out to work, they propose an alternative to the chore of shopping (de Coninck 2010), which can be easily replaced by online shopping. But the lack of free time of households where both parents work makes it more difficult, logistically, to organize home delivery for large volumes such as the weekly shopping and more especially in less densely populated areas such as the outer suburbs. This would mean making deliveries over short time slots or at precise times and outside of the usual working hours, that is, in the evenings or at weekends. But that kind of logistical organization is very costly for distributors, unlike deliveries with wider time windows or without time slots (Gevaers et al. 2011). Apart from the poor view taken of deliveries being made when no one is there to take them, it is more difficult for the distributor to put in place as it presupposes that temperature is controlled at all times and that storage boxes with refrigerated compartments can be provided, which are expensive. Another strategy emerges to reduce coverage of the last kilometre. By playing on the practices of consumers looking for instantaneous service, food distributors tend to promote modes of distribution outside the home, such as pick-up points (Gasnier 2007). They thus eliminate many of the costs inherent in serving sparsely populated areas (Boyer et al. 2009; Punakivi and Saranen 2001) by advertising the lower costs for consumers, who invariably find delivery costs too high for online sales in general and online grocery sales in particular (Bitoun 2009).

All told, for stores that propose home delivery, the targets are primarily people with decreased mobility, people who are dependent on others for their shopping and who *a priori* prefer to visit the shop and then have their purchases delivered. Their second target, families with children, does not necessarily correspond to a single strategy and may vary between in-store and online shopping, home delivery, and collection-point pick-up. In both cases, the target populations are found

throughout the area investigated. Families with children are an ideal-type of periurban household, and the elderly are increasingly present in the outer suburbs as their populations age (Berger et al. 2010). Apart from the low level of the offer, despite a varied customer base across all types of areas, companies tend to serve the different parts of the Dijon metropolitan area unequally.

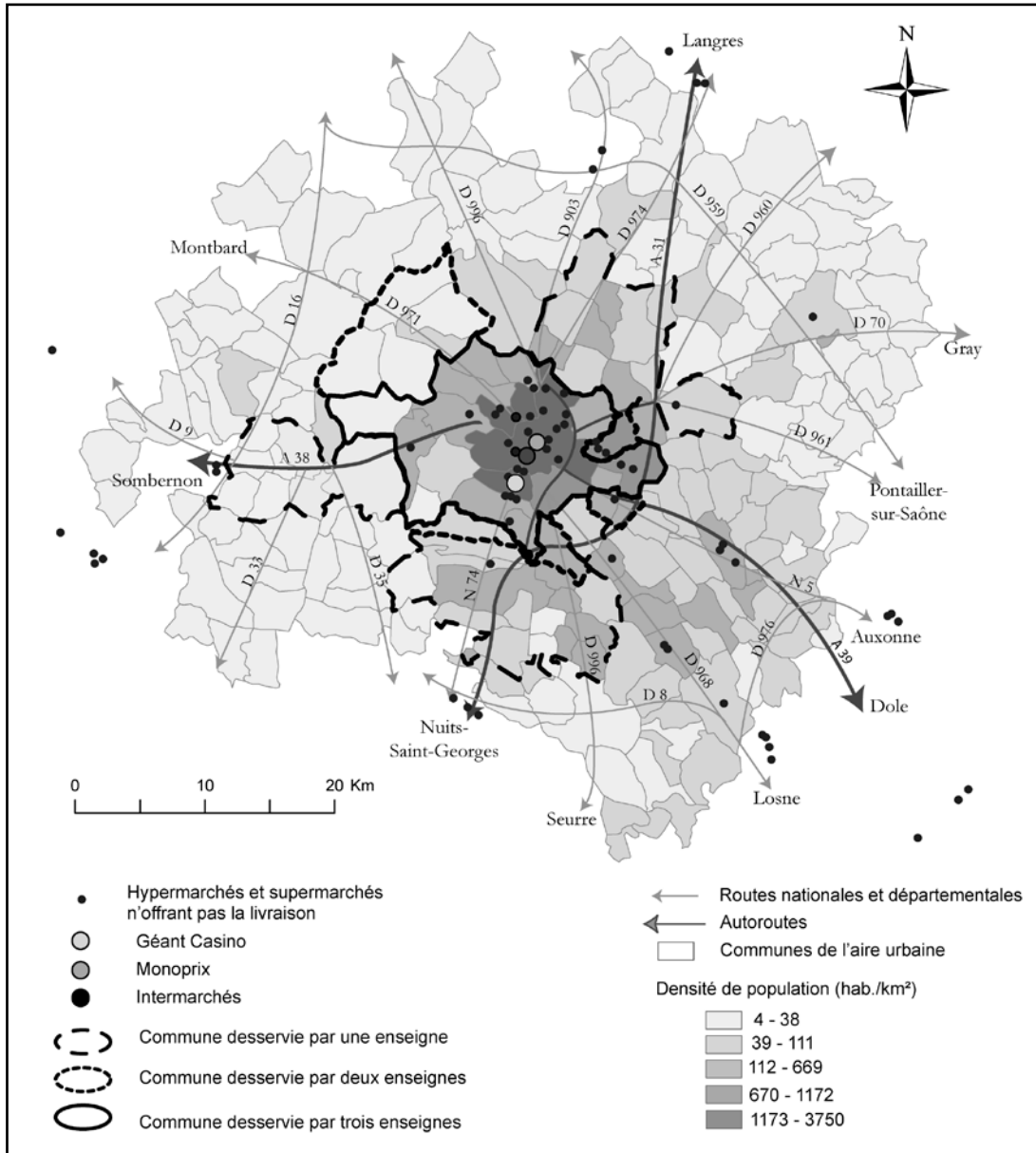
Coverage: from makeshift solutions to avoidance of the least populated areas

By observing, first, the areas covered by cybermarkets, the sum of their delivery areas (map 1) covers just 25% of the metropolitan urban area but includes more than 80% of its population. A far higher number of districts benefit directly from the cybermarket offer compared with the supermarket offer. This is reflected by a Theil index of 0.6 for cybermarkets versus 1.2 for supermarkets, displaying a lower statistical concentration. However, when the nearest neighbour method is used, the geographical dispersion for cybermarkets is equivalent to that for supermarkets with R indices of 0.5 and 0.4, respectively.

The greatest coverage is for MesCoursesCasino which covers 77% of the population for just 20% of the area, and lowest for Monoprix with 70% of the population and just 14% of the area. So cybermarket coverage areas largely overlap. They encompass all of the districts in the urban core, that is, the most populous districts. Apart from their population level, the choice of districts is also related to the fact that the chosen coverage is centred on the respective distribution points, all of which are located in Dijon or in contiguous districts. This logistical choice is aimed at minimizing the distances to cover when delivering to customers, as evidenced by the adjustment made by UTélémarket in Île-de-France. In the late 1990s, its first logistics warehouse was located in Rungis, while most of its customers were in Paris, 15 km away. The location soon proved too remote. So, between 1999 and 2001 the warehouse was relocated twice, moving it each time closer to Paris (Colin 2001).

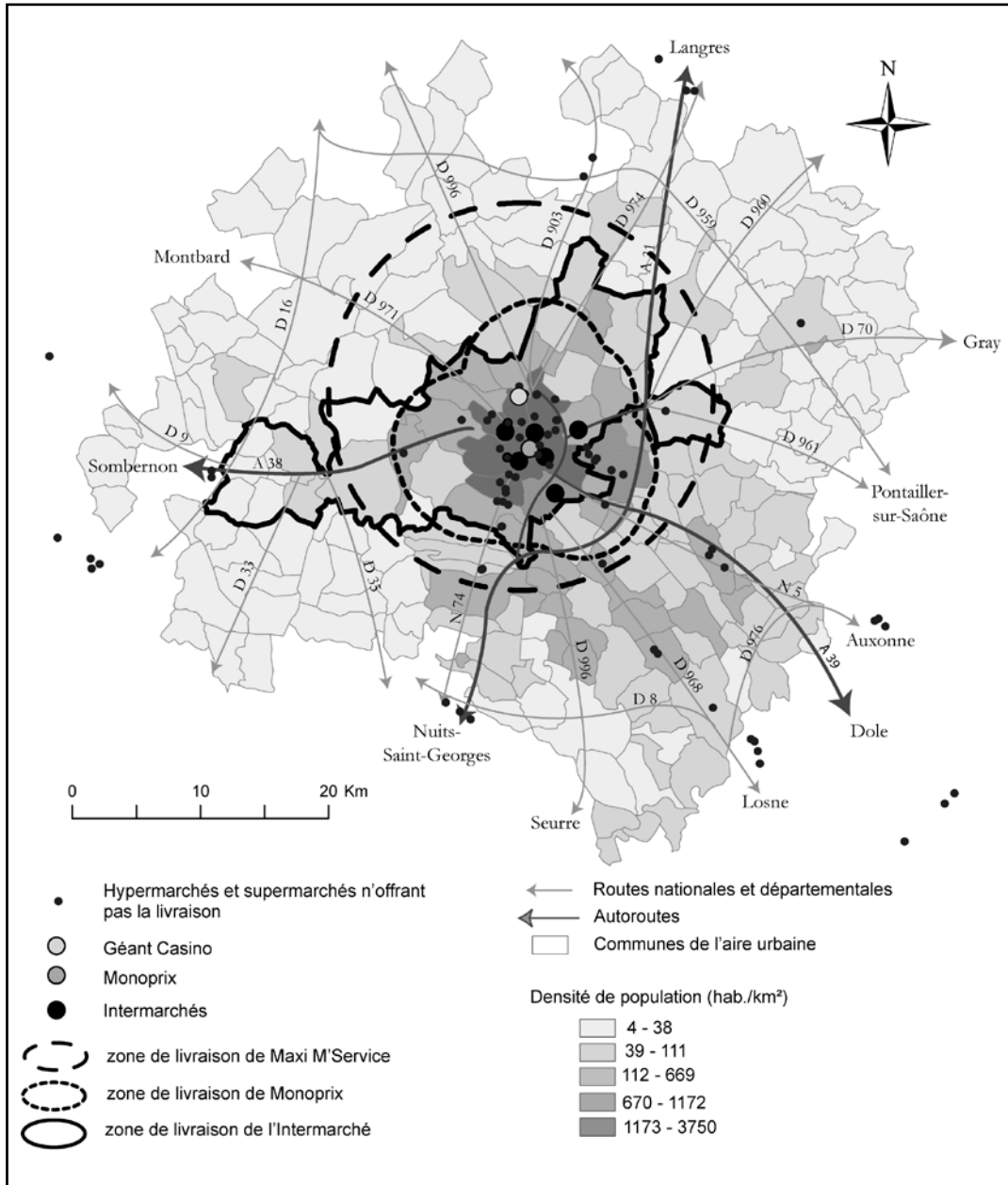
Consequently, the outlying parts of the metropolitan area remain outside the delivery range as they are too far from the distribution points and are home to few potential customers. For some e-stores that promised to serve rural areas, the advertising blurb was untruthful because, contrary to what was claimed, the company serves just six districts of the Dijon metropolitan area, none of which is in the outer suburbs. While the other companies propose larger delivery areas, the promise of access without transport restrictions to an offer equivalent to that of supermarkets remains impossible for most districts in the Dijon metropolitan area. Moreover, home delivery by cybermarkets tends to reinforce unequal access to shops for the outer suburbs compared with the urban core. The urban core already has the main supermarkets and the main shopping area on the edge of the city. It now also benefits from home delivery by supermarkets. However, some districts of the inner periurban belt are included in the home delivery areas, which improves their access to foodstuffs, especially for the least mobile populations. For districts in the outer periurban belt, they might be included in a delivery area if the distribution point were based at a supermarket on the peripheral shopping estate rather than in a city centre supermarket. Thus, for want of a store in the centre, Géant Casino distributes its cybermarket sales from its store in Chenôve in the south of the urban core. This enables it to cover many districts of the south of the metropolitan area, but probably increases the cost of deliveries to the district of Dijon itself and in the northern part of the urban core. However, it is doubtful that the Dijon market is large enough to warrant organizing cybermarket home delivery by geographical sectors.

Map 1: Cymbermarket delivery zones



Source: Laboratoire ThéMA

Map 2: Supermarket in-store purchase delivery zones



Source: Laboratoire ThéMA

In addition to a concentric pattern around the distribution points, the delivery areas jut out in places. These correspond first to high density areas. Then the delivery zones extend along the main radial roads, for example in the west of the metropolitan area along the A38 motorway, where Intermarché delivers up to 23 km from its distribution point. Lastly, post codes also shape the delivery areas. To make it easier for their customers to determine whether they are covered, Monoprix and Casino use post codes to inform customers whether or not deliveries are made to a district. This adds groups of districts to their delivery areas, some of which are quite remote from the distribution point and have very low population densities. For example, in the sector north-west of Dijon along the D971 road, the postal code 21121 covers seven separate districts. While some of them are contiguous or close to

Dijon, that of Val Suzon is 17 km by road from the Monoprix store and more than 20 km from the Géant Casino store in Chenôve.

The boundaries for home delivery are also characterized by their lack of extension to the east of the urban core and especially to the south-east on the River Saône plain. This part of the periurban area around Dijon does, however, have higher population densities because it includes small urban areas like Genlis with 15 000 inhabitants located 20 km from Dijon and with good road connections. The home delivery areas may not cover this zone because there are several supermarkets there. So cybermarkets outside of the heart of the agglomeration might try to avoid competition from local supermarkets. Another factor might be the lower level of income in this part of the metropolitan area, especially compared with the western part. The home delivery area for the Intermarché cybermarket encompasses districts with a high concentration of managerial grade customers to the west and north of Dijon. The extension of the home delivery areas along the A38 motorway to the west and between the D974 road and A31 motorway to the north is consistent with this rationale (map 1). The Intermarché home delivery area offers a greater reduction in access distance for managerial grade customers than for other categories. This is not so for the home delivery areas of the Casino and Monoprix cybermarkets, which do not seem to favour management grade customers rather than other categories of household, whereas it might be expected that the up-market position of these two companies compared with Intermarché would have encouraged them to do so.

For in-store purchases, the delivery areas (map 2) are smaller than those for online sales, except for Intermarché for which the two are identical. Deliveries for in-store purchases are by their nature less predictable and more urgent. They have to be dealt with within the hour, whereas deliveries of online shopping are scheduled at least 24 hours ahead. Accordingly, delivery areas tend to be smaller so as to allow for greater leeway in the event of a surge of activity or if destinations are too widely dispersed. The other characteristic of delivery areas for in-store purchases is that they have fuzzy boundaries. For both Monoprix and Géant Casino, the only indication given is about a radius of some 15 km around the store, without it being specified whether it is a Euclidean distance or by road. When asked about delivery to a district at the limit of the Euclidean distance of 15 km, the service provider was rather affirmative but non-committal, things being dependent on the feedback from the first delivery there. The provider reserved the option of declining further deliveries if the destination turned out to be too remote. In fact, the delivery area defined by a radius around the store is part of the agreement with the store and should theoretically be binding on the service provider. But is the means of calculating distance specified in the agreement? Besides, for all the delivery staff, demand is concentrated around the store and potentially litigious situations seem rare indeed.

To conclude, taking all the companies together, the home delivery area for online or in-store purchases remains limited and centred around Dijon and extends little outside of the agglomeration (maps 1 and 2). The periurban areas and the districts with few supermarkets are those most poorly served by home delivery. This means that territorial inequalities are intensified in terms of access to shops.

CONCLUSION

All told, the study of home delivery, of its organization, and of the areas served in the Dijon metropolitan area call into question the possibility of more uniform access to food products from one location to another. Distributors tend to prefer more densely populated areas to maximize their market share and cut costs for last-kilometre delivery as far as possible. Currently, it seems we are seeing increasing coverage of such zones to the detriment of less densely populated outer suburbs or rural areas, rather than a more even coverage of the metropolitan area (Rallet 2001). In terms of Internet use, this runs counter to there being a positive correlation between information and communication technologies and urban sprawl.

Several arguments suggest that this state of affairs is not yet permanent, even if there is no certainty that accessibility to foodstuffs in car-dependent areas will improve. As is the case in the Dijon metropolitan area, from one company to another, the service offered is not identical. The areas served vary greatly depending on company policy and on the company's ability to enforce it, especially because of the legal arrangements for its stores (isolated franchised store, franchised stores under the same ownership, owner-operated stores). For cybermarkets or stores, the home delivery service sometimes changes suddenly and the delivery boundaries as they are today may not be permanent. In addition to the local tacit agreements made by stores with outside providers, cybermarkets do not necessarily represent a stable source of supply. They may vanish, like the first online site set up by Casino, which returned to the cybermarket business some years later (Durand 2010). The delivery areas may therefore radically change and vary in size, as with Houra, whose area was reduced, or UTelemarket, whose area has never increased despite several announcements that it would do (Gavaud 2010, Durand and Senkel 2007). Unlike other types of product (cultural products), the supply of foodstuffs offered mainly by cybermarkets changes little. Cybermarket turnover increases slowly and to date no cybermarket has proved to be permanently profitable (Ranvier and Sury 2009). The existing supply remains fragile, then, and home delivery, which is one of the highest items on the liabilities side, has still not found the right model in terms of organization or of its geographical extent beyond the most densely populated areas. This absence of any model is maintained by the emergence of pick-up points or of collection from store, which enable companies to give up on home delivery. Adjustments are likely to occur in the districts on the edge of the delivery areas, whereas central districts can be surer to enjoy uninterrupted service and the choice among several companies. All told, short of an upsurge in demand for cybermarkets or home delivery for in-store purchases, the inequalities in home delivery shall become even more marked if the service is left in the hands of distributors alone.

Even so, several arguments suggest that government has a potential part to play if it is assumed that the choices of household location are to change little. In places where the service is not proposed (whether for in-store or online sales), individual initiatives tend to fill in for distributors. Transport services and community care services make this possible and save the stores the effort. Accordingly, the customers and government pick up the bill for home delivery. As part of the arrangements for care for dependent people and promoting home care, the departmental councils (which finance personalized autonomy allowances and so provide cover for the elderly or disabled) and the treasury (income tax relief for other households) are more or less directly involved in paying for this service. Other forms of delivery to areas may be imagined, such as the installation of individual or collective refrigerated containers for deliveries made when no one is at home, or partnerships with local retailers, and so on. Such arrangements raise the question, though, of who would pay for them and

the role of government in putting them in place. To what extent could or would government participate in nurturing such solutions, which are expensive and can be covered by other actors?

REFERENCES

Augereau V., Curien R., Dablanc L., 2009, « Les relais-livraison dans la logistique du e-commerce, l'émergence de deux modèles », Cahiers scientifiques du transport, Vol. 55, pp. 63-95.

Barth I., Anteblian B., 2010, « Séniors, grande distribution et courses ordinaires », Gérontologie et société, Vol. 135 (4), pp. 83-113.

Berger M., Rougé L., Thomann S., Thouzellier C., 2010, « Vieillir en pavillon : mobilités et ancrages des personnes âgées dans les espaces périurbains d'aires métropolitaines (Toulouse, Paris, Marseille) », Espace populations sociétés, Vol. 2010/1, pp. 53-67.

Berret P., 2008, « Diffusion et utilisation des TIC en France et en Europe », Culture chiffres, Vol. 2 (2), pp. 1-15.

Bigot R., Croutte P., 2008, La diffusion des technologies de l'information et de la communication dans la société française, Paris : CREDOC, Rapport

Bitoun O., 2009, E-commerce et distribution : comment Internet bouscule les canaux de vente, Paris : Acsel

Boyer K.K., Prud'homme A.M., Chung W., 2009, "The last mile challenge: evaluating the effects of customer density and delivery window patterns", Journal of Business Logistics, Vol. 30 (1), pp. 185-201.

Bras M.-A., Pégaz-Blanc O., 2012, Tableaux de l'économie française, Édition 2012, Paris : INSEE

Brousseau E., Kessous E., 2003, Impacts des NTIC sur les modèles logistiques du commerce électronique : nouveaux métiers, nouvelles formes d'intermédiation ?, Paris : PREDIT, Rapport

Cairncross F., 1997, The Death of Distance: How the Communications Revolution Will Change Our Lives, Harvard Business Press

Cairns S., 2005, "Delivering Supermarket Shopping: More or Less Traffic?", Transport Reviews, Vol. 25 (1), pp. 51-84.

Colin J., 2001, "The impact of e-commerce on logistics", Séminaire de l'OCDE/CEMT : The Impact of E-commerce on Transport, Paris.

Cullinane S., 2009, "From Bricks to Clicks: The Impact of Online Retailing on Transport and the Environment", Transport Reviews, Vol. 29 (6), pp. 759-776.

De Coninck F., 2010, « L'achat en ligne, un nouveau rapport à l'espace de la consommation ». Sociologies pratiques, Vol. 20 (1), pp. 51-62.

- Dumans M.-E., Chambolle C., 2002, « Internet et la grande distribution alimentaire française ». *Économie rurale*, Vol. 272 (1), pp. 42-56.
- Durand B., 2010, « e-commerce et logistique urbaine : quand le développement durable s' en mêle... », *Revue Française de Gestion Industrielle*, Vol. 29 (2), pp. 7-26.
- Durand B. 2008, « Les magasins de proximité : un atout logistique pour l'épicerie en ligne », *La Revue des Sciences de Gestion*, Vol. 229 (1), pp. 75-83.
- Durand B., Senkel M.-P., 2007, « La logistique de l'épicerie en ligne : vers une différenciation des solutions », *Décisions Marketing*, n° 45, pp. 75-89.
- FEVAD, 2011, *Chiffres clés, Vente à distance e-commerce aux particuliers*, Paris : FEVAD
- Gasnier A., 2007, « Les temps de mobilité des consommateurs au cœur des nouvelles logiques d'implantation de l'offre commerciale », *Espace populations sociétés*, Vol. 2007/2-3, pp. 243-254.
- Gavaud O., 2010, *Les déplacements liés aux nouveaux modes d'achat des produits de consommation courante. Approche comparative de l'efficacité écologique de l'achat classique en magasin, du e-commerce, du drive-in et de la livraison de caddies*, Nantes : CETE de l'Ouest, Rapport
- Gevaers R., Van de Voorde E., Vanelslander T., 2011, "Characteristics and Typology of Last-mile Logistic from an Innovation Perspective in an Urban Context", In: Macharis C. et Melo S. (eds), *City Distribution and Urban Freight Transport: Multiple Perspectives*, Edward Elgar Publishing, pp. 56-71.
- Gratadour J.-R., 2001, « La logistique du commerce électronique », *Réseaux*, 106 (2), pp. 135-147.
- INSEE, 2010, *Le commerce en France édition 2010*, Paris : INSEE
- Koster R., 2002, "Distribution structures for food home shopping", *International Journal of Physical Distribution & Logistics Management*, Vol. 32 (5), pp. 362-380.
- Li F., Yousept I., 2004, "Online Supermarkets: Emerging Strategies and Business Models in The UK" 17th Bled eCommerce Conference, Bled (Slovenia)
- Moati P., 2009, *La Vente à distance dans la nouvelle révolution commerciale*, Paris : CREDOC, Rapport
- Motte-Baumvol B., 2008, « L'accès des ménages aux services dans l'espace périurbain francilien », *Strates*, Vol. 14, pp. 149-164.
- Murphy A.J., 2007, "Grounding the virtual: The material effects of electronic grocery shopping", *Geoforum*, Vol. 38, No. 5, pp. 941-953.
- Ogawara S., Chen J.C.H., Zhang Q., 2003, "Internet grocery business in Japan: current business models and future trends", *Industrial Management & Data Systems*, Vol. 103 (9), pp. 727-735.
- Poirel C., Fernandez D.B., 2008, « La stratégie de distribution multiple. À la recherche de synergies entre canal physique et canal virtuel », *Revue française de gestion*, Vol. 182, No. 2, pp. 155-170.

Punakivi M., Saranen J., 2001, "Identifying the success factors in e-grocery home delivery", *International Journal of Retail & Distribution Management*, Vol. 29, No. 4, pp. 156-163.

Rallet A., 2001, « Commerce électronique et localisation urbaine des activités commerciales », *Revue économique*, Vol. 52 (7), pp. 267-288.

Ranvier M., Sury R., 2009, *La vente de produits alimentaires sur Internet : un état des lieux en 2009*, Paris : CREDOC, Rapport

Shen Q., 2000, "New telecommunications and residential location flexibility", *Environment and Planning A*, Vol. 32 (8), pp. 1445-1463.