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# Analysis of supply chains with multi-channel distribution

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Palabras clave del trabajo:
supply chain, distribution, multi-channel, grocery market.

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## Project Summary

New technologies and predominantly the internet have been essential in the evolution of commerce in the last few decades. There have been changes in how companies work internally, how companies interact with each other and also in the way they interact with customers.

This paper tries to analyze how e-commerce has changed the business environment, in how companies are using this potential to enhance their relationships with another companies in order to strengthen their competitive position; and the effects on distribution and logistics of the emergence of a new channel and the synergies and opportunities that originate.

The focus will be on the evolution of the multi-channel format, where customers can make use of both physical and online channels to improve their experience, and companies can overcome the barriers and limitations of single-channel approaches. The study will cover both online retailers implementing a physical presence and brick-and-mortar companies expanding their business online.

The last part will be an in-depth research on the grocery market and the development of its online channel, concentrating on Western Europe and North America; and with emphasis on its distinctive characteristics and challenges.

## Resumen

Las nuevas tecnologías y predominantemente internet han sido esenciales en la evolución del comercio en las últimas décadas. Ha habido cambios en la forma en que las empresas trabajan internamente, como interactúan entre ellas y también en la forma en que interactúan con sus clientes.

Este trabajo intenta analizar como el comercio electrónico ha cambiado el entorno empresarial, en cómo las empresas están usando este potencial para mejorar sus relaciones con otras empresas con el objetivo de reforzar su posición competitiva, y los efectos en distribución y logística de la emergencia de un nuevo canal y las sinergias y oportunidades que se generan.

Se hace hincapié en la evolución del formato multicanal, donde los clientes pueden usar tanto el canal físico como el online para mejorar su experiencia, y las empresas pueden superar las barreras y limitaciones de los enfoques de un solo canal. Este estudio cubre tanto los vendedores online que implementan una presencia física como las empresas físicas tradicionales que expande su negocio por internet.

La última parte es un estudio en profundidad del mercado de la alimentación y su desarrollo por este canal online, concentrándose en Europa Occidental y Norteamérica; y con énfasis en sus características y retos distintivos.

# 1. Introduction

## Internet and modern supply chains

Online commerce probably has been the biggest change in business in the last 25 years. Not only has changed distribution, but has affected each and every aspect of the enterprises. New managers need to understand this new environment in order to give their company an edge over other competitors across the globe.

Moreover, it has allowed a new level of coordination between companies. This is especially important in modern supply chains. The old integration paradigm spearheaded by Henry Ford, in which companies would acquire all the resources needed in order to execute their activities has given pass to a new inter-connected approach, where companies work together in sync as if they were one.

This paper tries to deliver some insight into the impact of online commerce in supply chains, specializing on multi-channels distribution models. Traditional companies have embraced the new online distribution channel and integrated it into their nucleus. This gives possibilities to synergies and leverage of assets to increase competitiveness. This subject has been researched extensively in the last decade, as supply chain as a whole is a relatively new topic, and internet and its uses and limitations are still largely unknown.

The first chapters will cover an introductory background into the evolution of supply chains, from a more academic point of view; as well as a brief presentation of e-commerce and its importance in modern companies. The following chapter will elaborate on the characteristics of the multi-channel format by studying each channel individually, the opportunities that presents for companies and the possible drawbacks; covering the expansion of both traditional and online enterprises.

Finally, the research will focus on the grocery market. The choice was made according to several reasons. First, the inherent difficulty of handling perishable and sensitive to temperature items gives this market a challenge not seen on many more-popular online markets. In addition, the low value-per-volume of the products complicates delivery and profitability of the distribution models, especially online. And last, these complexities have blocked several business models, so this market and its companies are still experimenting on different approaches, making it more interesting for research.

Starting by analyzing the intrinsic market characteristics, the investigation will explore the different approaches past and current companies have taken; and how the models have changed and evolved along the years.

## Objectives

The objectives of this research paper are the ones described as follows:

- Perform a brief analysis around supply chain as a business subject.
- Study how competition has changed the way companies work, internally and externally.
- Analyze e-Commerce, its current status in sales and its impact on the management of supply chains.
- Study single-channel and multi-channel approaches to business (focusing multi-channel on physical + online retail)
    - Inspect both channels separately, in order to understand its particularities
    - Evaluate the possible synergies and drawbacks that could occur using a combination of them
    - Investigate the possible barriers to adopt a multi-channel distribution model and ways to overcome them
    - Study the problematic of delivery for online retailers
- In-depth analysis of the grocery market, particularly of the online and multi-channel distribution models
    - Analysis of the grocery business market, characteristics and particularities
    - Introduction of the first online grocery businesses
    - Obstacles to its progress and profitability
    - Implementation of new sustainable models

## Research methodology

The development of this paper will be founded on the knowledge and skills acquired during the Degree in Business Administration. For further references, were used a great number of research papers on several academic journals, in subjects such as Operations, Logistics and Marketing. Most of them were accessed through the University's online catalog.

Some books were also instrumental to understand the more academic and theoretical aspect of the supply chain subject.

## 2. Introduction to Supply Chain Management

### Origin

Supply Chain Management is one of the newest and increasingly fundamental parts of modern companies. Even though this discipline's development started just three decades ago, changes in our business environment heightened competition and pushed companies to look for new approaches in trying to deliver for their consumers.

> *As a fledging discipline, Supply Chain Management is at present going through a period of great research activity in an effort to define its boundaries and build up a solid body of knowledge to be put at the service of progress in business. (Alfalla-Luque & Medina-López, 2009)*

Among the main factors that started this change we can include globalization, increased competition, information technologies, etc. These have altered the economic environment and the way that companies can achieve success on it.

But even if we are talking about an emerging business subject, modern companies are not the first ones who came across similar needs. Primarily trade and military campaigns required the management of enormous flows of people and supplies, in a time where they didn't have access to current technologies. For example, Donald W. Engels (1978) analyses in his book *Alexander the Great and the Logistics of the Macedonian Army* all the problems that came across when trying to provide an army with its many demands, further limited by the primitive developments of the 4$^{th}$ century BC.

As Michael Hugos (2011) describes it: "Nothing entirely new… just a significant evolution"

### Definition

As a rising subject of study, many scholars have tried to coin a definition for Supply Chain that would reflect its use in modern companies. Here we can see some of them:

- "A supply chain is the alignment of firms that bring products or services to market" (Lambert, Stock, & Ellram, 1998)
- "Supply chain is defined as a group of inter-connected participating companies that add value to a stream of transformed inputs from their source of origin to the end products or services that are demanded by the designated end-consumers" (Dawei, 2011)
- "A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers" (Ganeshan & Harrison, 1995)

From these definitions we can extract what really differentiates SCM from other disciplines. Whereas most business subjects focus on an individual company, a supply chain extends from the initial supplier to the end-consumer of the product, giving us a broad picture of all the processes that are needed in order to fulfill the

objectives. This image of companies connected to each other is key to understand how businesses work nowadays.

> *There is a difference between the concept of supply chain management and the traditional concept of logistics. Logistics typically refers to activities that occur within the boundaries of a single organization and supply chains refer to networks of companies that work together and coordinate their actions to deliver a product to market. Also, traditional logistics focuses its attention on activities such as procurement, distribution, maintenance, and inventory management. Supply chain management acknowledges all of traditional logistics and also includes activities such as marketing, new product development, finance and customer service. (Hugos, 2011)*

Most authors divide the supply chain in a series of flows, though there is no real consensus on the number or the definition of these. For the purposes of this paper, we will use Rekha (2013) and Alshawi's (2001) approach. These authors distinguish the following three flows:

- Physical flow: involving the exchange of raw-materials, supplies, semi-finished products and final products, all along the supply chain.
- Information flow: including all the necessary information for internal operations if the company and external interactions with other members of the supply chain.
- Financial flow: concerning all the transactions and money exchanges across the supply chain, from the customer to the first supplier.

**A new kind of competition**

Markets have grown increasingly competitive, and companies need to have an edge over their rivals. In order to achieve this, there has been a trend of companies focusing on their most important activities (core competencies) and outsourcing the rest, where other companies, concentrated on those activities, will do a better job that they would in the first place.

This trend runs opposite the highly vertically integrated style of last century, where firms like Ford owned the majority of its suppliers. But this system lacks flexibility and customer orientation, meaning it cannot compete on most current markets.

> *Instead of vertical integration, companies now practice "virtual integration." Companies find other companies whom they can work with to perform the activities called for in their supply chains. How a company defines its core competencies and how it positions itself in the supply chains it serves one of the most important decisions it can make. (Hugos, 2011)*

This "virtual integration" means that multiple companies work as one. Each company acts like a link in the chain, perfectly coordinated from the beginning to the end: the customer. Of course, this strategy requires a much deeper connection and sharing between companies.

**Collaboration and procurement**

Johnson and Whang (2002) define it as “business-to-business interactions facilitated by the internet. (…) These include such activities as information sharing and integration, decision sharing, process sharing and resource sharing”. Alshawi (2001) proposes a holistic point of view for the future: understanding enterprises as a loose collection of trading partners.

The main aspect is information-sharing and visibility between each link. If a company has the necessary information, like inventory levels or demand expectancy for their partner, processes can work way more efficiently, reducing uncertainty and miscalculations like bullwhip effects (Lee, Padmanabhan, & Whang, 1997). Furthermore, Garicano and Kaplan (2001) predict that the reduction of transaction costs by new technologies can originate that “fewer transactions will be undertaken inside firms and more will be undertaken in the market or outsourced”.

According to Ganesan (1994), companies such as *General Motors* or *Black & Decker* are trying to develop a sustainable competitive advantage (one that can be maintained over long periods of time) through long-term relationships with their suppliers. Not only can a close relationship with a supplier be profitable in itself, but it can be really durable due to its inherent barriers to competition (Golicic, Davis, McCarthy, & Mentzer, 2002) (Day, 2000).

The degree of interaction can vary from simple trading partner to forming strategic alliances. In some cases, companies may even work together in some activities, like product design. For example, Danish electronics company *Bang & Olufsen* has a close partnership with different car manufacturers such as Audi, Aston Martin or BMW, to design car audio products for these brands.

This trend has been influenced by the increasing complexity of the products developed and the buyer-seller coordination and flexibility necessaries to fulfill the diverse market needs (Pyke & Johnson, 2002). But even though long-term relationships with other companies can be extremely profitable for both parties, Day (2000) points out that we shouldn’t see it as a new paradigm for business. One reason for this is that not every transaction or exchange should be viewed as a long-term commitment, because not all transactions are worth the resources and effort of establishing a close relationship. Another reason is its difficulty to manage, because of possible conflicts and, in some cases, the need to integrate computer systems and software, in order to effectively connect the companies (O'Brien, 1999, quoted by Alshawi, 2001). A study on strategic alliances published on MIT Sloan Management Review shows that half of them end up failing (Dyer, Kale, & Singh, 2001).

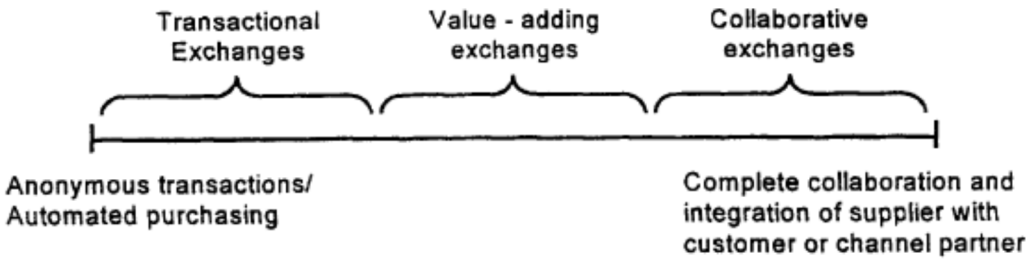
Furthermore, globalization has pushed companies to achieve lower cost alternatives (Pyke & Johnson, 2002), looking for cheaper suppliers that can allow them to lower prices, or get provisions in short notice to cover for unexpected demand. Forecasts are sometimes not very accurate, and firms require enough flexibility to overcome possible mistakes. Recently, Toyota has faced this problem with the introduction of their first hydrogen-fueled car, the Toyota Mirai. The Japanese manufacturer expected 400 units to be required for 2015, but after just

one month on sale in Japan, received 1.500 orders (Nichols, 2015). Even though Toyota has increased production to 700 cars this year and 2.000 on 2016, the company is in risk of losing a great number of sales, due to customers facing at this moment a two-year waiting period (Greimel, 2015)

Day (2000) proposes a model called "The relationship spectrum", locating exchanges across a continuum. Those are divided in three broad sections:

- Transactional exchanges: when a company only wants a timely exchange of standard products at a competitive price.
- Collaborative exchanges: the relationship has a long-term orientation with mutual commitments. It's more common in customized or key supplies.
- Value-adding exchanges: the focus of the seller firm shifts from getting customers to keeping them (Child, et al., 1995). Johnson and Wang (2002) also discuss the option of signing a long-term contract with a supplier up to a certain level and, when needed, purchase additional quantities online.

Figure 1. Relationship Spectrum




Day (2000)

According to Pyke and Johnson (2002), there are four main factors that can drive a firm towards closer relationships with a partner:

1. Strategic importance of the purchased component
   If the component is customized or critical for differentiation, it's advisable to maintain a closer link with the supplier.
2. Number of suppliers
   If there are multiple sellers for the product or service, the company can adopt a more transactional approach. However, if the supply is limited to fewer sellers, it's best to establish a collaboration, in order to ensure its availability.
3. Complexity
   More complex components require a closer relationship between partners. In some cases, collaboration goes deeper into product design.
4. Uncertainty
   If the company is uncertain about the supply or the quality of the products, it should establish a closer approach.

As the understanding of both extremes has improved, many analysts and academics are advocating for a middle ground, were every relationship should be studied and decisions taken in an individual basis.

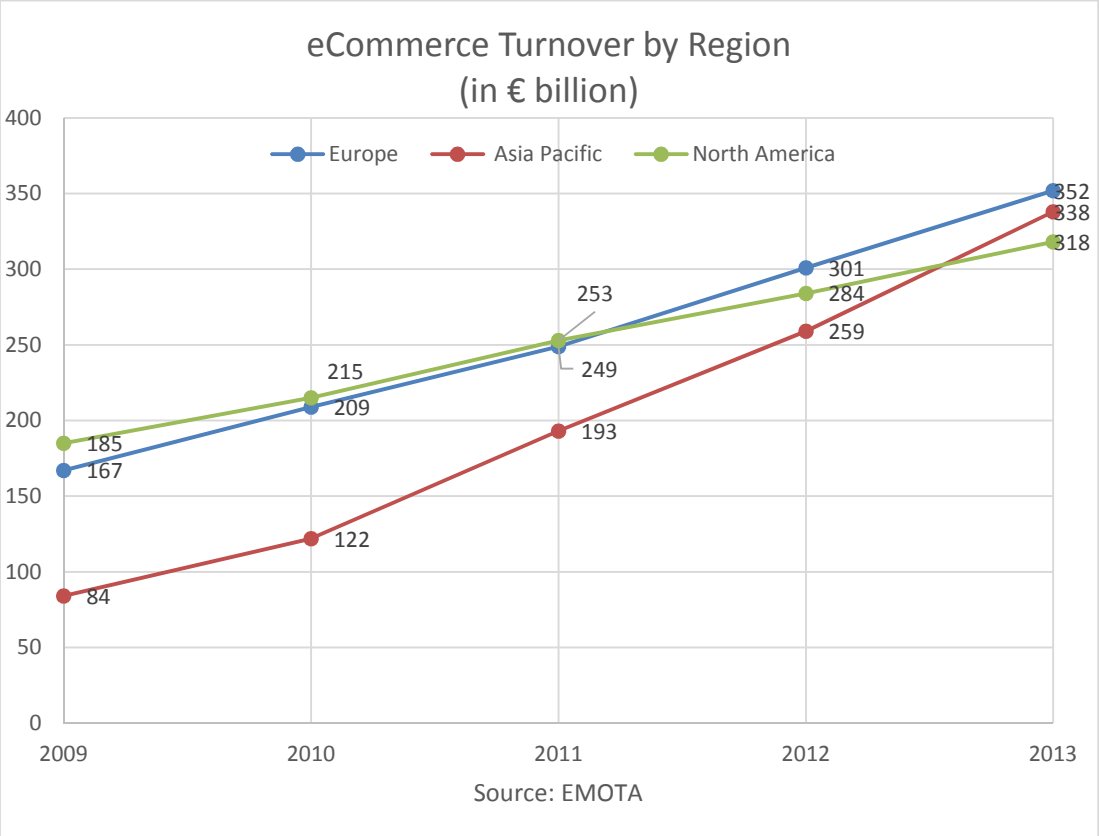
## 3. E-Commerce

### Definition

E-Commerce involves transactions and business communications through the internet (Rekha, 2013). Sometimes it can be confused with term E-Business, even though they mean different things. E-Commerce covers outward-facing processes (involving customers, external partners or suppliers), and E-Business includes those processes plus all the internal ones (Bartels, 2000).

### Why is it important?

In the last years we have seen an increase in online sales throughout the world. Companies like Amazon, Paypal or eBay paved the way for the growth of a new channel. In words of Patti Freeman Evans, retail analyst at Jupiter Research: "They created trust, and that was a huge thing in a self-regulating environment" (Banham, 2005).



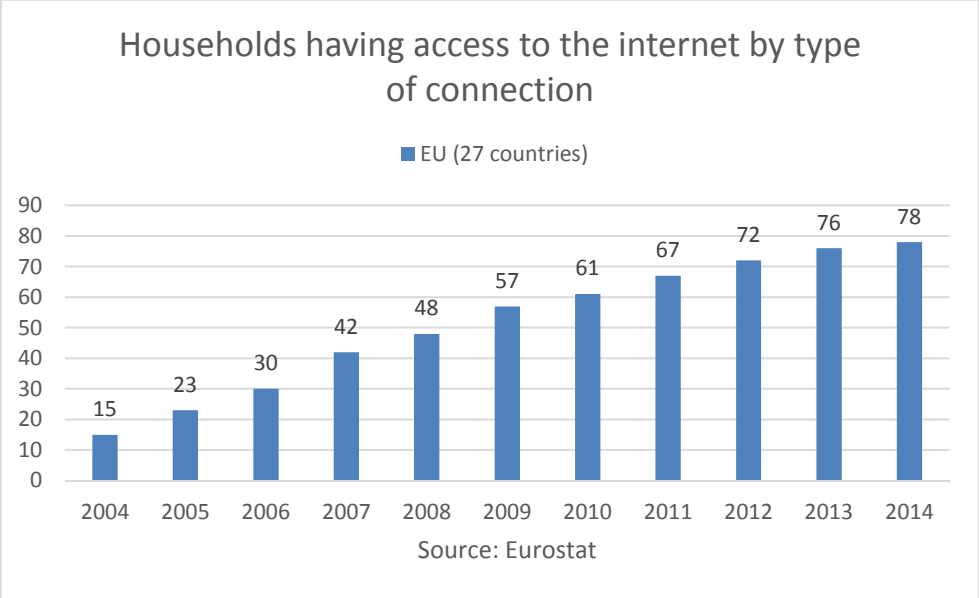

Graph 1. E-commerce turnover by region

Even though United States companies were the pioneers, Europe has become the leader in e-Commerce sales, after an average growth of more than 20% since 2009. According to Deloitte's European Commerce Assessment (2012), the European market is a highly segmented one. Northern Europe's consumers lean more towards online shopping, although Southern European companies have better consumer-facing capabilities.

Internet access has spread really fast in the last decade, and with that, the number of people who can access online stores. During that time period, an

average of 3% of the European population became new clients for online sellers, driving this number up to 47% in 2013.

> *"The e-commerce industry is a force that no investor can afford to ignore" Cushla Sherlock, Corporate Communications at Credit-Suisse*




Graph 2. Households having access to the internet by type of connection

**Emergence of Mobile e-Commerce**

Internet access availability in mobile phones and the emergence of tablets is having an effect also in commerce. Many online stores are adapting their online stores for these devices so customers can shop wherever and whenever they want, and sales are growing year after year. Commerce firm Shopify announced in 2014 that 50.3% of the sales on their stores came from mobile devices. Mobile phones accounted for 40.3% from these sales (www.shopify.com, 2014).
Some analysts preview that this segmentation will continue with other devices like Smart TVs, smart watches or game consoles.

Getting in front of the computer or tablet might still be a barrier for some people to participate in online shopping. That's why some companies are going one step further by creating devices made exclusively for shopping, leveraging their technology knowledge. Amazon introduced recently the Amazon Dash, a device capable of adding items to the AmazonFresh shopping cart using voice recognition or barcode scanning. Strategies like this one could be fundamental in trying to expand e-commerce into less tech-savvy consumers.

> *"I can't overstate how mobile is changing how we interact with our consumers, we have to embrace these changes" Joel Anderson, CEO of Walmart*

*"Mobile is not the future, it is the now. Meet your customers in the environment of their choice, not where it's convenient for you"*
*Cyndie Shaffstall, Founder of Spider Trainers*

**Impact on SCM**

We discussed previously the three flows that make up a supply chain. E-Commerce becomes important for its capacity to affect all three of them, in different ways.

- Physical flow: Access to more information can make the transportation and inventory for physical goods more efficient. Furthermore, it allows companies to reach more markets and customers
- Information flow: Internet increases the amount and quality of the information, as well as its availability all across the supply chain.
- Financial flow: Exchanges can be done faster, safer and in a comfier way.

All these advantages can be translated into a stronger competitive position for companies using different strategies (Porter, 1980). E-Commerce can create greater efficiencies for cost-driven companies, add higher value for differentiation strategies or help specialized firms identify and serve its target customers.

Chopra and Van Mieghem (2000) propose a list of activities that could be performed through the internet, across the supply chain:

- Providing product and other information
- Negotiating prices and contracts
- Placing and receiving orders
- Tracking orders
- Filling and delivering orders
- Paying and receiving payment

Even though e-commerce has been implemented for almost two decades, the potential is still very high and the introduction of newer technologies will increase the applications and benefits for companies and consumers.

# 4. Single-Channel and Multi-Channel strategies

## Background

We are seeing an increase on the number of companies that are using more than one channel to distribute their products. Each channel offers its own set of pros and cons, but a multi-channel approach enables the company to extract the benefit of both, and also exploit synergies between them. This also adds more value to the customer and makes the product available in more than one way (Thomas, 2002).

As customers have grown accustomed and less wary of the new online channel, they also became multi-channel shoppers, with different preferences for each channel (Nunes & Cespedes, 2003). Not only that, but people who use more than one channel tend to spend significantly more, up to 4 times more for customers buying on physical shops, online stores and catalogues (Stringer, 2004).

This takes form usually with traditional, bricks-and-mortar retailers adding an online channel to their existing ones, and pure online retailers opening physical shops, or collaborating with other traditional retailers (Agatz, Fleischmann, & van Nunen, 2007).

Good examples for the first case are *Carrefour* or *El Corte Inglés* in the Spanish market. Traditional stores that added an online store to reach more customers, or increase their value offering to the existing ones. In the second case, we could include Dell. Originally, Dell only made available its products only through telephone or online channels. But in the last years, decided to increase proximity to customers working with physical stores, such as Best Buy in the US.

Moreover, having a multi-channel strategy allows the seller to choose the most appropriate channel for each product or for every market (Berman & Thelen, 2004).

But of course, this addition also creates a whole new layer of complexity. Before attempting this channel expansion, the company must fully understand the characteristics of each channel and how can affect its products. Setting a new distribution channel is usually really costly and many times can yield less profit than expected, or even substantial losses. A common problem is sales cannibalization between channels. If not done right, the company may not increase their sales amount, but just give existing customers another way to buy the same products. This is a usual fear of supermarkets, since existing customers' needs are limited, and they would need to get a huge number of new customers to make the move profitable.

Before we go further in-depth, it would be advisable to analyze both physical and online retailing separately, so as to understand their particularities.

<u>Physical store retailing</u>

The key aspect of this distribution channel is location. The store must be placed where the customers are, because this is fundamental for its success. Some companies, such as *Apple* or *Zara*, are extremely meticulous on this. Also

essential is the immediacy of the transaction. The customer can see the product and take it home straightaway. This can be really powerful, as it can trigger “impulse buying”. This effect could happen in other channels, but not as strongly. It helps a lot the fact that clients can see, feel, or touch the products (Berman & Thelen, 2004).

This direct nature can also help get sales that would be lost in other environment. If a customer cannot find a product, he may choose another one that satisfies his needs. Or, in addition, a complementary product. The store also has personnel at his disposal to advise and help, which adds value to the customer. Some products, due to their complexity, may benefit more from this quality. This fact can also reduce greatly the number of returns, since feeling the product can make the customer more confident about its quality.

A physical store could also profit from offering additional services that a customer can require. These can be related to the product he is being such as a clothing shop offering to adjust trousers or coats; or non-related, like supermarkets with dry-cleaning, kiosk or photo printing services. These could be integrated in the same company, or owned by others.

Finally, shopping on physical stores has also a social component. Malls have become the new meeting points, what helps drive sales up. Some people even use shopping as a stress-reliever, what is usually called “retail therapy” (Scott, 2014).

Online stores

If location defines traditional retailing, the lack of it characterizes online shopping. One can buy virtually any item anywhere. This breaks geographical barriers and lets companies access to new markets that were unavailable before, and to customers that live far away from retail stores. This also affects cost structures, since small companies with a limited budget can still access a worldwide market, making it easier to find enough customers, even for niche products (Anderson, 2008). This, combined with other practices like crowdfunding, allows for really small companies to create products that maybe wouldn’t be profitable in their local market, but can be profitable in a global one.

Another fundamental point is the difference in inventory structure; while brick-and-mortar shops must keep an inventory in the shop, ready for the client, online stores can keep the items stored in distant facilities, where costs are much lower. This allows for a more extensive range of products (Agatz, Fleischmann, & van Nunen, 2007). Internet has proven to be very successful at selling products in the long tail.

Online stores must take into account that all products sold include also a delivery service. For that reason, forecasting grows more complex as is not enough to ensure the availability of the product, but also delivery. Usually that means that every sale must be perfectly coordinated with the third-party logistics provider, probably between countries. Delivery itself creates a barrier for customers, in order to return items. In a study conducted by Jupiter Communications, 37% of consumers stated that they would be more likely to shop online if returning

products was easier (Thomas, 2002). Some companies have already started to bridge this gap by offering free returns or home collection.

Customization has also been a key aspect of this channel, since firms don't need to build up mass quantities of stock, allowing them to add more value to the customer. But still, means that the production process is intervened by the client desires, making it less efficient and more costly.

The automated nature of the system allows customers to buy at any given time. This is particularly interesting for those who live far away from shops, or busy people who have trouble finding time for it. At the same time, changes in the system are instantaneous, and a store can modify prices or offer promotions much more easily, letting them use pricing as a short-term demand management tool (Agatz, Fleischmann, & van Nunen, 2007).

Interestingly, online shopping creates opportunities for mass retail data, which can be used for sellers to customize the experience, adding value. Many webpages have personalized recommendations, by studying past sales from that client or recently viewed items. Other similar tools, like the use of "wishlists", can also be used to anticipate demand.

Internet makes much easier to search and compare products and shops. Robert Kuttner (1998) defines it "as a nearly perfect market because information is instantaneous and buyers can compare the offerings of sellers worldwide". The result, as he puts it, "is fierce competition, dwindling product differentiation, and vanishing brand loyalty". The channel characteristics makes homogenous products very likely to suffer strong price competition (Brynjolfsson & Smith, 2000). Thus, companies tend to differentiate themselves and focus on attracting more loyal and profitable customers (Srinivasan, Anderson, & Ponnavolu, 2002).

Another powerful tool available is mass opinion. Most stores provide some way for customers to review products, and those opinions may guide other customers. This information can make new customers feel more confident about buying those products, or redirect them to others. Public opinion is becoming increasingly relevant thanks to an easier access to information. According to the 2014's VWO eCommerce Report, 55% of shoppers say reviews are important to them when making a buying decision (Nagpal, 2014).

Lastly, some companies are trying to take advantage from these features to shift from pure product manufacturing to service providing. Management literature has proven that services are more profitable (Oliva & Kallenberg, 2003). For example, the American company *Dollar Shave Club* manufactures shaving blades and other related products, but instead of offering them like a product, they provide a subscription-like service, where they send the customer all the needed items periodically. This way, clients don't need to worry about buying them, they would just get them in the mail as soon as they need it, since delivery frequency can be adapted individually.

### Channel conflict

It is crucial to separate online expansion from a retailer to a manufacturer. For a retailer, there is no possible conflict, because in essence it's performing the same function, and would not affect its suppliers. However, a manufacturer establishing a direct channel with consumers can create a conflict with resellers. These decisions should be taken in conjunction, to ensure good relationships across the supply chain, and to study possible synergies between companies.

R. Wilson (1998) describes this as the "Manufacturer's dilemma":

> *If you do not sell your products directly over the internet, people will go to your competitors who do, while if you do sell your products directly, your distributors and dealers will desert you and only carry products from manufacturers who do not compete with them.*

Many important manufacturers, such as Black & Decker or Gibson, had to abandon their online store projects due to retailer pressure (Lee, Lee, & Larsen, 2003). This shows the difficulty of the matter, and is critical in the e-business development.

### Integration barriers

Opening a new distribution channel can be a daunting task, primarily because it may force the company to deal with activities that never had to perform before. Furthermore, the technological nature of the process may force the company to change the way they operate, being both expensive and difficult to implant. Computerized integrated stock control and ordering system, payment services or delivery coordination are just a few of the critical needs (Lee, Lee, & Larsen, 2003).

The critical part comes with modern supply chains. As stated on the first chapter, supply chains involve several companies working in conjunction. A process of integration in those cases requires not only the focus company to restructure its activities to provide a seamless experience, but also forces the partners across the supply chain to do the same. Harland, Caldwell, Powell and Zheng (2007) indicate that the main barriers to supply chain information integration are "lack of strategic alignment of information strategies in the chain, firm size of some supply chain actors, lack of awareness of potential benefit of e-Business, lack of motivation, and being in a less developed industry or regional context". Their research points that due to lack of scale economies and resources, SMEs are less likely to invest in new technologies and associated training and education. Furthermore, smaller businesses are often less aware of its potential profits.

They also highlighted the fact that greatest benefits of e-Business occur when its application is fully integrated throughout the chain". This can pose a problem for bigger companies trying to streamline their production and distribution, since its supply chain partners may not share their ambitious plans. This problem is often overlooked on cross-channel integration literature. Recommendations for bigger companies leading the change are to build appropriate information integration

bridges to smaller supply chain members and a relationship of mutual trust between trading partners (Harland, Caldwell, Powell, & Zheng, 2007).

**Outsourcing**

The addition of a new channel requires more resources and an expertise in areas that not every company has. For this reason, many companies decide to outsource some of this activities. Some firms, such as eBay Enterprise (formerly GSI Commerce) or Amazon, focus on providing these services with multichannel capabilities. For example, Office Depot and Amazon established a partnership, where Amazon would process the credit card transactions and provide customer service, and Office Depot would manage inventory and product fulfilment (Berman & Thelen, 2004). This lets each company work on their core competencies.

There are four main ways of implementing an online store:

- Creation of a proprietary online platform
  By far the more costly, but also the more customizable. Having total control over the platform means that it can adapt to any circumstances, but it also requires a great investment and maintenance, making it not adequate for every business.
- Third-party customized e-Commerce provider
  Works with the same principles as the previous case, but requires a deeper connection between seller and provider. Services are deeply customized and can perform further activities such as order fulfilment or product returns.
- Third-party standardized e-Commerce provider
  Focused mainly for small-to-medium businesses, it's based on the customization of a pre-built online store, provided by the third-party, who also takes care of the correct operation and maintenance of the store. The exact activities performed by the third-party depend on the company.
- E-marketplaces
  Popularized by eBay, they are the internet equivalent of a street market. Multiple small sellers group into a single platform to get the attention and reach that would be unable to get by themselves. This method has been used in B2B markets by creations of networks of buyers and suppliers (Pyke & Johnson, 2002).

**Synergies and cohesion across channels**

Having a solid brick-and-mortar presence to build upon is surely a great resource, because multi-channel retailing provides diverse opportunities to leverage tangible and intangible assets (Berman & Thelen, 2004). Moreover, it avoids one of the weaknesses of pure online channels: lack of trust (Steinfeld, Bouwman, & Adelaar, 2002). But the challenge is imposed when trying to coordinate both channels as a whole.

Retailers that allow consumers to shop seamlessly across channels are considered more capable of meeting their needs (Lewis, Whysall, & Foster, 2014). Brian Unmacht, REI's senior vice president of retail, indicates that the focus should be to "develop a consistent customer experience, regardless of the channel by which the customer chooses to shop". But this harmonization not only

creates a better consumer experience; it also brings out the benefits from potential sources of synergy (Steinfeld, Bouwman, & Adelaar, 2002)

Next we will study the different cross-channel opportunities that arise. This examination is based heavily on the works of Chopra & Van Mieghem (2000) and Steinfeld, Bouwman and Adelaar (2002).

Reduction of inventory costs

- Reduction of safety stock, due to statistical aggregation of multiple inventories
- Reduction in stock of low-volume items across physical stores, leaving them available for purchase in online stores, centralizing its inventory and further reducing it

Transportation costs

- Using shops as pick-up locations, combining its shipment with the regular ones, and avoiding to pay for home-delivery ("last mile")
- When delivering to the customer's home, using the local store as the origin point for said delivery can be a source of savings

Processing costs

- The consumer participates actively and autonomously in most of the ordering process (information search, order input, payment)
- Due to the reduction of routine tasks, employees have more time for higher-value activities

Information sharing

- Reduces the bullwhip effect and improves the accuracy of forecasts

Sales and promotions

- Increased margin on direct sales due to intermediary bypassing
- Specialization of services across channels, using the most appropriate for each activity
- Cheaper and more flexible promotion, because there is no need to print and mail catalogues or vouchers
- Real-time inventory information prevents customers from wasted trips
- In-store web kiosks can be used to further bridge the gap between online and offline channels (Prasarnphanich & Gillenson, 2003)
- Retail stores gives first-time consumers an experiential shopping experience and introduces them to the brand, making it more likely for them to shop in other channels in the long run (Avery, Steenburgh, Deighton, & Caravella, 2012)
- Cooperative cross-channel marketing can improve sales in all channels or drive sales from less profitable channels to more profitable ones (Avery, Steenburgh, Deighton, & Caravella, 2012)
- Positive brand associations are likely to transfer to the other channels after repeated exposure (Avery, Steenburgh, Deighton, & Caravella, 2012)

**Brick-and-mortar going online**

After the collapse of the dot-com bubble, many traditional retailers grew wary of attempting an expansion to online retailing. But the last decade saw new sustainable models emerge (Agatz, Fleischmann, & van Nunen, 2007). Adding an online channel to an existing traditional retail strategy has been a really common procedure. Brick-and-mortar retailers possess built-in advantages to online shopping, such as brand awareness or existing large customer bases (Prasarnphanich & Gillenson, 2003).

> *There was a time when the online and offline businesses were viewed as being different. Now we are realizing that we actually have a physical advantage thanks to our thousands of stores, and we can use it to become No.1 online. (Raul Vasquez, Warlmart.com chief executive, quoted by Avery, Steenburgh, Deighton, & Caravella, 2012)*

An online channel can perform diverse functions for a traditional retailer:

- Complementary distribution channel
  This is the most basic one, allowing the company to access customers outside of their stores reach.
- Research tool to drive more traffic into the stores
  Kent Zimmerman, The Finish Line's director of E-Commerce described in this way their website. Many people perform "virtual window shopping" while commuting, waiting or just relaxing at home. A 2005 Jupiter Communications study asserts that customers use companies' web sites to search for product information and performs comparisons, then go to physical stores to make the actual purchase (Prasarnphanich & Gillenson, 2003).
- Offer a wider selection of products, or customized ones
  Physical constraints limit retail stores on their product offer. As Chris Anderson (2008) indicates: "retailers will carry only content that can generate sufficient demand to earn its keep". This leaves many less-popular products behind. However, lower transaction costs in online stores can turn them into profitable sales.
- Marketing channel and contact with customers
  Internet, paradoxically, allows for a more direct and personalized contact with a customer. Bart Weitz, professor and director of the Miller Center for Retailing Education and Research at the University of Florida declared: "When I walk into a store, nobody knows who I am. But when I venture into a company's virtual store, I am a known entity with specific preferences. This information now carries over into all my interactions with that company" (Banham, 2005).
  More recently, social media has accentuated this even more. Companies can have a straight communication with clients and extract really valuable information to adequate their strategy. 55% of shoppers in the 18-34 age bracket say that Facebook keeps them informed about the latest in online shopping (Nagpal, 2014).

**From clicks to bricks**

The opposite path comes from pure internet retailers to build a physical presence. Even the biggest online firms are feeling the restraints of e-Commerce. Jeff Wilke, senior vice president of Amazon, identified "instant gratification" available in traditional sores as the key challenge to Amazon's growth (Brynjolfsson, Hu, & Rahman, 2009). Multi-channel retailing through the introduction of physical stores is their attempt to level the playing field.

> *Our primary competitors are brick-and-mortar, so we have to be really responsive from a fulfilment standpoint. More and more, we're going to be competing with the guy down the street where a customer can drive and pick up an order the same day (Kurt Goodwin, vice president of operations at Crunchfield, quoted in Dubbs, 2002)*

Similar to the bricks-to-clicks approach, the adoption of a new channel seeks to fulfill different functions and add different values to the company:

- Proximity to customers
  Shoppers can experience the product and take it home instantly. Co-founder of jewelry label BaubleBar declared "We've always believed that an offline presence was key to building a brand. Men and women touch and feel our product and they immediately understand what BaubleBar is about" (Gustafson, 2014)
- Marketing and visibility tool
  Scott Moore, vice president of marketing at Best Buy, revealed that "Stores act as the brand's billboard". Managers are considering stores as living advertisements that generate reach and enhance the brand message (Avery, Steenburgh, Deighton, & Caravella, 2012), and that could translate into more online sales in the future. Andy Dunn, Bonobos' CEO stated "Our biggest insight, was that customers didn't have to walk out of our store with a purchase to be happy with their experience" (Davis, 2014)
- Reinforced customer service
  Provides a physical place where return, exchange or repair items, giving more confidence to distrustful clients (Prasarnphanich & Gillenson, 2003)
- Pick up location for orders
  Grants another delivery option for customers, and at the same time avoids the extra home delivery, which tends to be the most expensive segment. Furthermore, it encourages them to visit the store (Prasarnphanich & Gillenson, 2003). Since 2011, Amazon is creating a network of lockers, usually located at partner-company 7-Eleven stores, where customers can pick up or return their orders.

Even though companies haven't extracted yet all the potential that e-commerce and multi-channel distribution possess, for many people this seamless integration of physical and online represents how business will be conducted in the future.

> *"This is the convergence of e-commerce and bricks-and-mortar. The idea that it's the one or the other is ridiculous. E-commerce as a term will become obsolete in five or six years" Neil Blumenthal, Warby Parker's CEO*

*“We will continue to see a convergence of the digital world and physical world. Those who conquer that trend will be market leaders” John Phillips, Senior Vice President of Customer Supply Chain and Logistics for Pepsico, Inc.*

*“People don’t call it e-commerce anymore. It’s called omni-commerce, and it’s the idea that digital permeates every step of the purchase chain from product discovery to trial to pricing to actual purchase” Tolman Geffs, Co-President of the Jordan Edmiston Group*

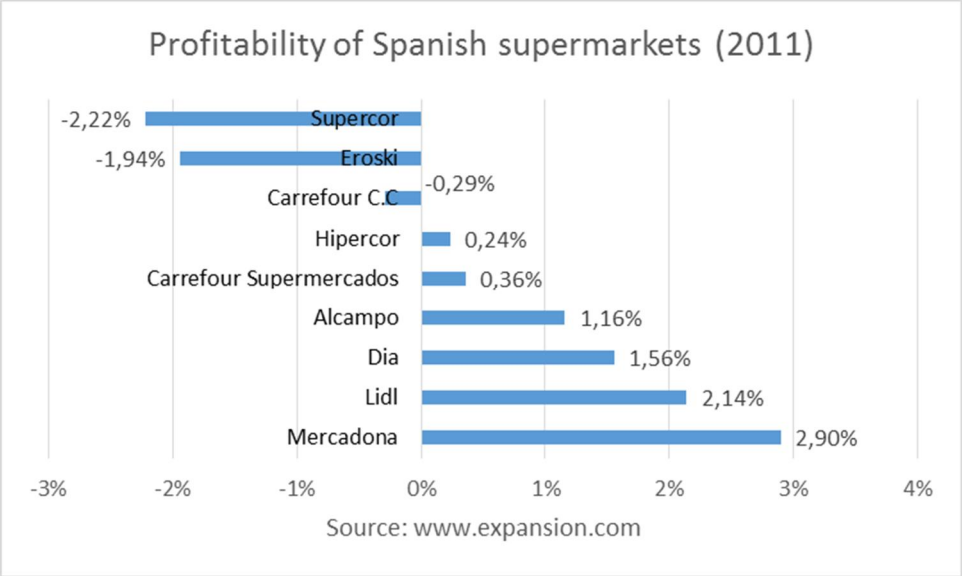
# 5. Grocery market

## Introduction

Grocery retailing is one of the most difficult and competitive businesses around. The characteristics of the market are terribly complex and even the top companies must make huge efforts to innovate if they don't want to be left behind.

Supermarkets confront supply chain challenges all along. The average supermarket carries 30.000 SKUs (stock-keeping units) in constant flux and also must adjust their prices constantly (Boyer & Hult, 2005), from a large number of providers and locations, requiring very high standards for databases and inventory control. To makes matters worse, a considerable number of these products have different needs and limitations, like being perishable or needing to be in specific temperatures at all times, thus making the logistic element further difficult.

In addition to that, grocery products have a really low economic value per volume, what limits the options of transportation and storage, because high competition restricts non-efficient choices. Competition levels are so high that net profit margins fluctuate around 1-2%. According to a 2011 study made by newspaper Expansión, the average of the Spanish industry was only 1.18%.




Graph 3. Profitability of Spanish Supermarkets

During the dot-com bubble and predominantly in the United States, firms like Webvan, HomeGrocer or FreshDirect were created with the intention of providing a new approach on how groceries were bought and sold. This first generation wanted to revolutionize the market but was met by numerous barriers and limitations, added often to a lack of understanding of the industry, leading to the closing of almost all of them.

This chapter aims to understand the market characteristics, focusing on the advantages and disadvantages of online grocers; the causes of the first generation failure, with special attention on the delivery and distribution problems;

the role of brick-and-mortar retailers on the development of new profitable models and the study of these new models and its expectations.

**Market characteristics**

A study on shopping behavior performed by Morganosky and Cude (2001) showed that for 73.6% of people, convenience and time saving was the most important reason to shop for groceries online. This suggests that convenience can be one of the main advantages for online retailers. Going to the supermarket and self-picking all the items can take a lot of time, coupled with possible additional time waiting in line. Studies conducted in Finland by The Helsinki Research Institute for Business Administration LTT in 1997 found that households shop on average 4.6 times a week, spending on average 48 minutes on weekdays and 58 on weekends. This supposes approximately 200 hours a year. Being able to order specifically the items one needs and getting them delivered home is clearly a positive aspect. According to a study by McKinsey and Company, 82% of consumers order groceries online as a substitute of regular trips to the supermarket (Hays, Keskinocak, & Malcome de López, 2005).

Moreover, a study made by GroceryWorks revealed that consumers typically buy repetitively the same goods each time they make purchases. For that reason, some authors sustain that online groceries should focus on demands that don't have to be fulfilled immediately, as fast delivery would hurt profitability, but still represent the bulk of the total purchases (Tanskanen, Yrjölä, & Holmström, 2002) (Morganosky & Cude, 2001). Streamline carried out an experiment in conjunction with Procter & Gamble that follows this idea. The company asked its customers if it could add automatically a toothbrush to their shopping cart every 3 months, as American Dental Association recommends. This created a large increase in sales of toothbrushes in the following months (Hays, Keskinocak, & Malcome de López, 2005).

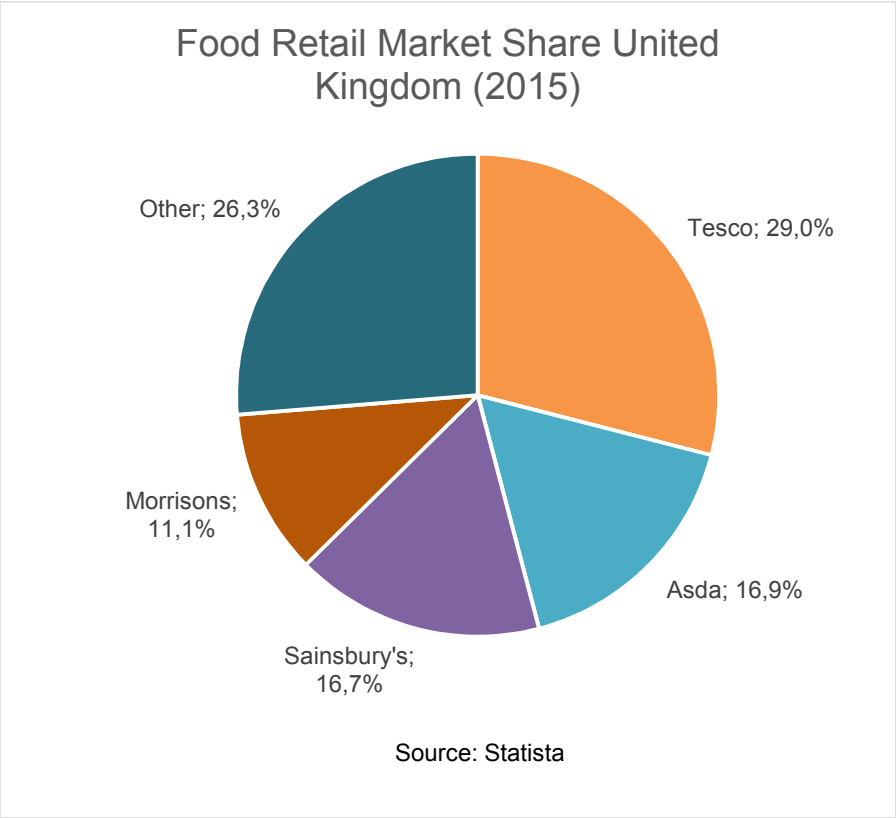
Morganosky and Cude's shopping behavior study also pointed out that 30% of customers would not buy online meats or produce items. This backs up Boyer and Hult (2005) proposition on product quality, by which customers want to be able to select the fresh goods. Other authors believe this issue has to do with trusting the company (Tanskanen, Yrjölä, & Holmström, 2002). The argument would be that customers do not need to select them themselves, but they want to be sure that the quality of the products is good. E-groceries must provide good quality fresh products in order to gain trust and overcome this problem.

Price reduction has been a key subject in many e-Commerce businesses, but interestingly, it's not really an important issue in e-groceries. Low margins mean that price differences between companies cannot be very high, and shoppers designate convenience and time-saving as the most important factors for using this channel.

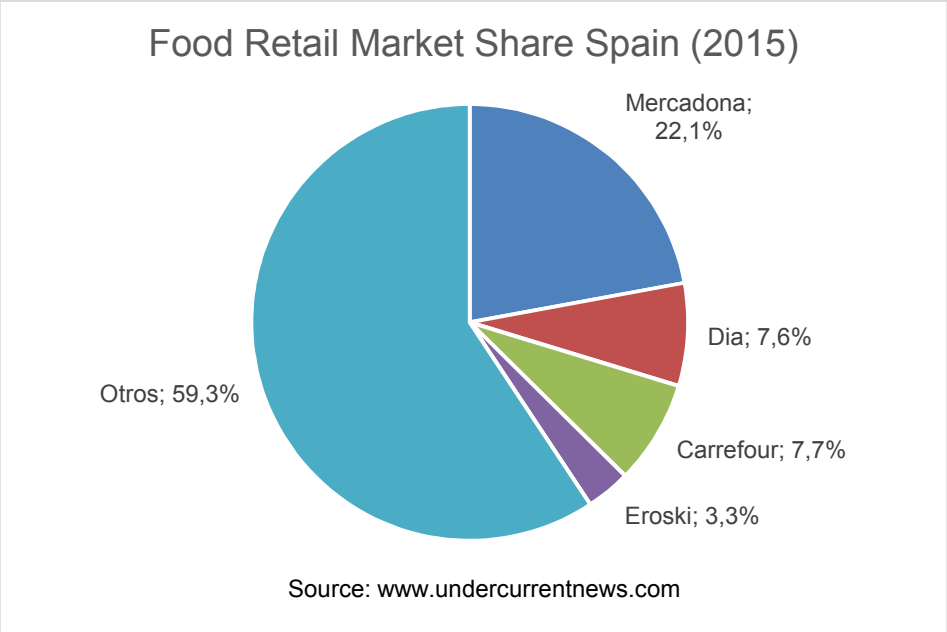
**Supply chain environment in the food industry**

Although we talked before about how globalized and international markets have become, the grocery industry remains as a highly localized one. This is due mainly because shoppers frequent supermarkets close to their homes (Cotterill, 2006), so competition is limited around a radius of a few kilometers. This can be understood as a spatial differentiation against other rivals.

Furthermore, the market is really concentrated around a few retailers. In most countries of Western Europe, more than half of the total market share is dominated by less than five companies (El País, 2015). We can see the high level of concentration on the graphs.

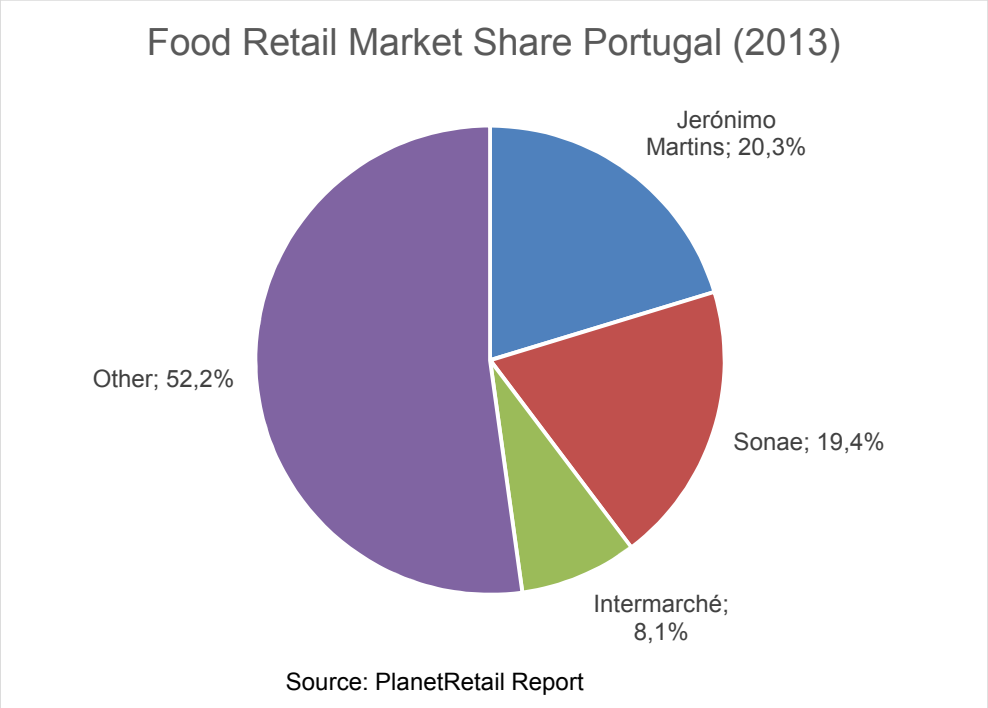



Graph 4. Food Retail Market Share United Kingdom



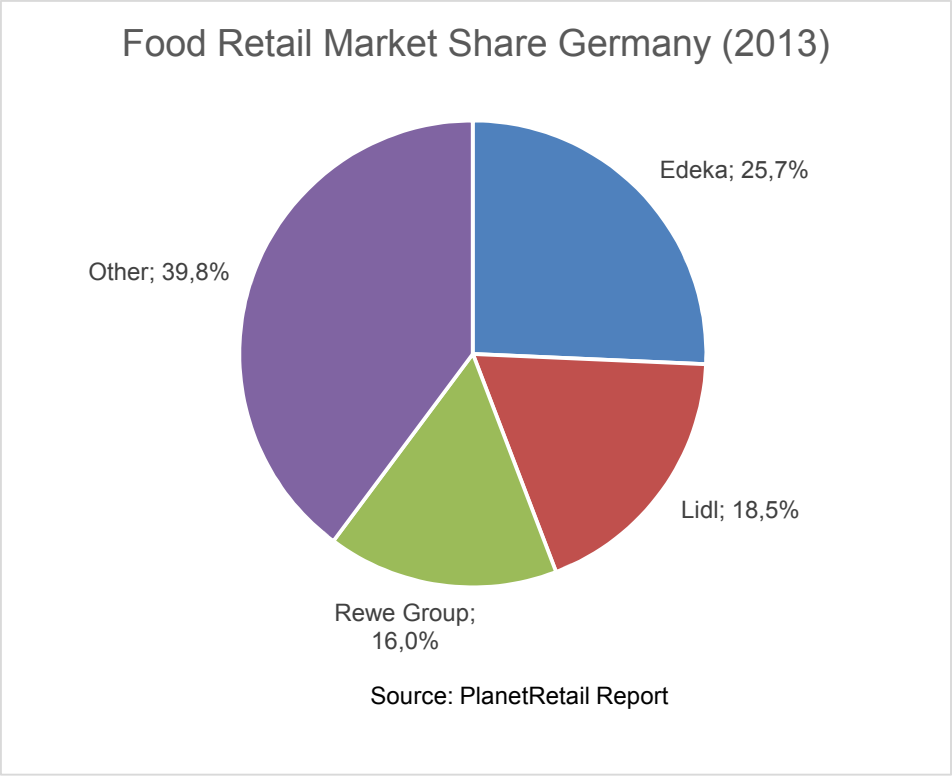

Source: www.undercurrentnews.com

Graph 5. Food Retail Market Share Spain




Source: PlanetRetail Report

Graph 6. Food Retail Market Share Portugal



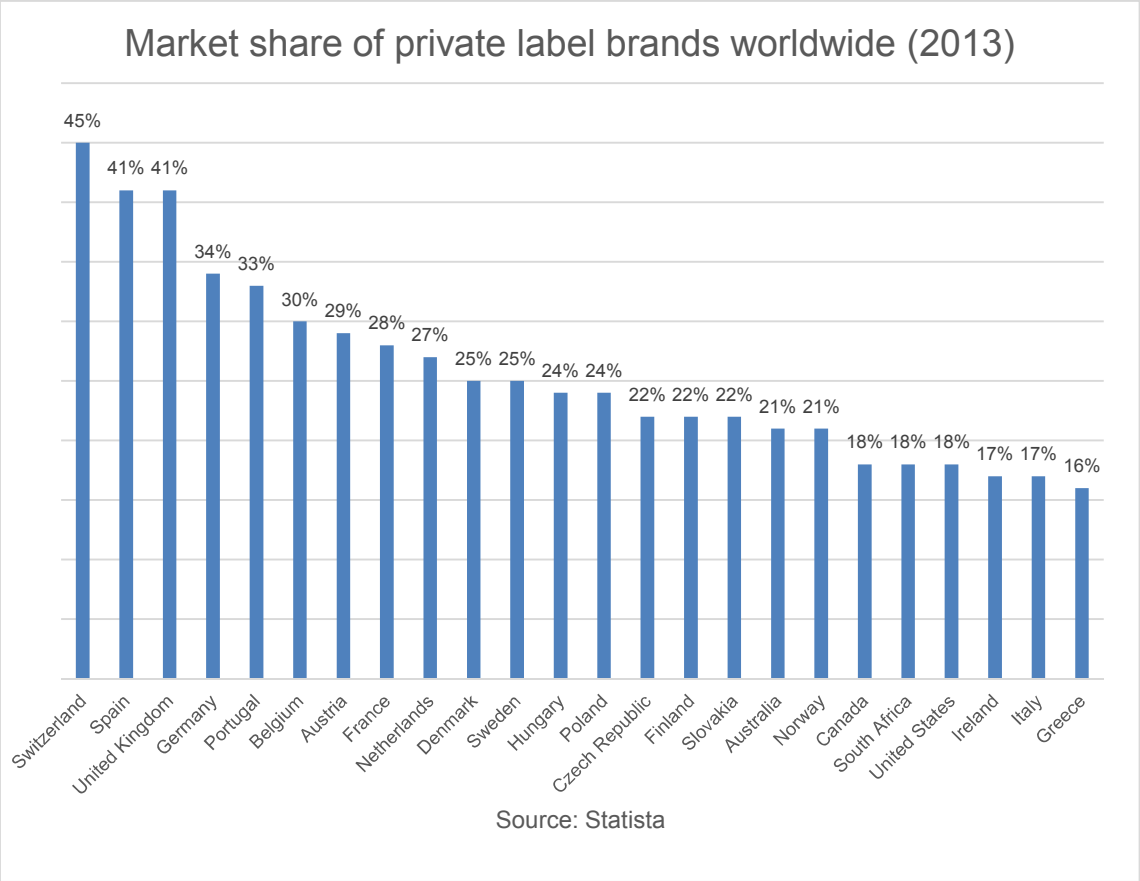

Graph 7. Food Retail Market Share Germany

This high concentration is the result of great number of mergers and acquisitions in the last decades, with the objective of increasing market share and power, allowing for retailers to exert substantial buying power over the suppliers. The latters have very limited access to consumers, since a huge part of the sales come from supermarkets and similar. Even large brands like Procter & Gamble or Unilever are affected by this lack of bargaining power. And of course, small producers, such as farmers are even more powerless, also due to the absence of differentiation of their products (Nicholson & Young, 2012). This has been a great concern of antitrust commissions all over Europe.

Additionally, as this Consumer International report points out, supermarkets have both influence power over consumers and suppliers. As they get better terms from the suppliers, being able to reduce prices, their market share grows; and with lower prices, they can increment their market share even further.

**Private labels**

Private label products are those sold under a retailer's name, or a name created by that retailer, or a member of the same wholesale group. The increasing power of retailers is closely related to the emergence of these private labels (those owned by retailers). According to PLMA in Portugal, Spain or UK, 40% of fast-moving consumer goods are private label products (Arce-Urriza & Cebollada, 2012)




Graph 8. Market Share of private label brands worlwide

The current economic situation has also pushed consumers to look for lower-cost alternatives to many products, coupled with an improvement in terms of quality, branding and packaging (Young, 2005). Store brands have been moving away from copying national brand designs and packages, and creating their own identity as a brand. Research carried by the United States Department of Agriculture reveals that, on average, private labels are priced 23% lower than national brands. These values are lower than those found in older data, implying that they are becoming more similar in price and quality.

Of course, this means that retailers have become competitors to their own suppliers. Limited shelf space means that smaller food manufacturers cannot afford to pay for it, in addition to more spending in advertising, needed to differentiate from these labels, and that produces even more consolidation up the supply chain.

**Delivery**

This may be the key point and problematic that defines e-groceries. Although a "last-mile" delivery service for customers embodies the convenience of the e-groceries approach, it creates important logistical problems for the companies.

> *Especially in the case of low-value items, such as groceries, transportation costs are a key determinant of the business viability. (Agatz, Fleischmann, & van Nunen, 2007)*

Attended home delivery

This has been the main distribution model for delivery of online orders, largely because it doesn't require reception technology and provides a face-to-face service to customers (Kämäräinen, The reception box impact on home delivery efficiency in the e-grocery business, 2001). In some cases it can be necessary: security reasons, perishable products, large products or service included in the delivery, like an assembly service (Agatz, Campbell, Fleischmann, & Savelsbergh, 2008).

However, it forces customers to stay home for an average of 2-hour window in order to receive the order. Durand (quoted by Colla & Lapoule, 2012) estimates that 30% of home deliveries fail because there is no one at home, making it necessary to schedule a redelivery. This adds to the cost of the delivery. And delivery cost is an important matter, as it affects greatly to the profitability of the business. It was discussed earlier in the paper that e-Commerce expands the reach of the company and enables sales to customers further away. However, Taskanen, Yrjölä and Holmström (2002) argue that the opposite happens in e-groceries: "The effectiveness of operations depends critically on local customer density".

Table 1. Spanish supermarkets delivery characteristics

| | El Corte Inglés | Caprabo | Carrefour | Condis | Grupo Eroski | Gadisa | Mercadona |
|---|---|---|---|---|---|---|---|
| Shipping cost | 6€ for orders below 100€ | 5,5€ for orders below 96€ | 8,99 for orders below 99€ | 6€ for orders below 90€ | 5,98 € | 4,5€ for orders below 72€ | 7,21 € |
| Time window | 2h | 2h | 2h | 2h | 2h | Mornings or afternoons | 2h |

(Martínez, Manuela, & Fernández, 2008)

Backed up by empirical analysis made at the Helsinki University of Technology, they suggest that the critical factor for the e-grocery business is sales per geographical area. Since delivery costs go down as customer density increases, the objective is achieve enough customers in an area for that area to be profitable. Besides, the firm must aim to supply as many products as possible, since delivery cost is virtually the same for a 20€ or a 200€ order. Customer loyalty has been recognized as many authors as a crucial path to profitability in e-Commerce, because of the high cost of acquiring new customers. Webvan spent 133$ on marketing and administration for every order during its lifetime. Coupled with low margins, it's clear that profits are only achieved after several transactions. Thus, occasional shoppers are less interesting than loyal ones (Srinivasan, Anderson, & Ponnavolu, 2002).

> *Usually only some continuously-used products that are out of stock in the consumer's home are used immediately. Providing an express service for small orders of such items for occasional customers us the surest way to ruin the profitability of an e-grocer (Tanskanen, Yrjölä, & Holmström, 2002)*

Seeing how critical transportation efficiency is for attended home delivery, a key factor is management of time slots. More time slots may offer a better service, but it could reduce the density of the deliveries. In the same way, narrower time slots are more convenient for customers, since they don't have to stay at home as much time to receive the order, but also reduces flexibility and costs. Nockold (2001, quoted by Cullinane, 2009) discovered that a reduction in window delivery width from 3 hours to 1,5 increased costs from 17 to 24%.

To meet the requirements of customers while keeping the routing costs low, e-grocers must use really advanced optimization technology systems (Hays, Keskinocak, & Malcome de López, 2005). The universities of Lancaster and Southampton, together with Warwick Business School carried out a research with the objective of mining great quantities of data (provided by an unnamed retailer) in order to predict when customers would want their orders to be delivered (Shankleman, 2014).

Another tool is real-time slot optimization: providers can reduce the amount of slots available on popular hours, or increase their price (or also reduce delivery fees for less popular hours), in order to adjust the schedule in a more productive way (Agatz, Campbell, Fleischmann, & Savelsbergh, 2008). A variation of the last one was implemented by Ocado. Going by the name of "green van slots", customers can choose at checkout for a van with a time slot already allocated for their area, with a reduction of the delivery fee. Ocado not only markets it as a way to provide more efficient service, but also as a way to reduce CO2 emissions.

This challenges have opened the door for other business models to emerge, such as online order aggregators. For example, the Google Express service provides same-day or overnight delivery for customers who order from several stores in the area. By consolidating a number of orders into one, reduces the chances of delivery failure and thus improves potential profitability. And as online sales increases across all markets, is expected that the aggregation business will grow in the next years.

Unattended home delivery

According to a study from 2003, unattended delivery is the most cost-efficient delivery model (Punakivi, 2003, quoted by Hays, Keskinocak, & Malcome de López, 2005), because it allows for optimal routing and scheduling of delivery vehicles. In addition, it increases the service received by the customers since they don't have to be at home.

However, it presents with a series of logistical challenges, especially on the transportation of perishable or temperature-sensitive products. Companies like Streamline of Shoplink (both now out of business) installed refrigerated boxes in customer's garages, and then rent them to customers. Another option is for consumers to buy their own reception box. In any case, it is a huge investment that requires a big commitment and time to pay off (Hays, Keskinocak, & Malcome de López, 2005). Tanskanen, Yrjölä and Holmström (2002) determine that for e-grocery to succeed, new houses and offices should be built with capability for unattended reception. Peapod tries to offset this problem by using

a low-cost method: insulated coolers packed with dry ice (Hays, Keskinocak, & Malcome de López, 2005).

A middle-road option are shared reception boxes. This system has been used before for regular shipping, like DHL's Packstation, that allows for self-service collection of shipments. Customers can collect them there if the regular home delivery failed, or directly ask to be delivered to a Packstation nearby. Amazon has implemented a similar strategy by installing proprietary lockers for its shippings in 7 Eleven stores. Nonetheless, grocery items are a more demanding task, since reception boxes must be installed with refrigerators, sometimes with several of them at different temperatures, to keep products in perfect state. It can even more cost-effective, since vans can drop several orders at the same time, and many customers can use the same reception box. This boxes are locked, and customers can receive text messages with the code to unlock them and access to their order (Kämäräinen, The reception box impact on home delivery efficiency in the e-grocery business, 2001). This option becomes less interesting when shared boxes most be located further away from the customer's home, since it reduces the convenience of home delivery.

Store pick-up

This has been the preferred model for brick-and-mortar supermarkets that opened an online channel. By leveraging their existing store network and brand image, physical stores have already an advantage over pure online retailers.

This distribution system only offers a picking service for the customer, who would need to go to the store anyway. But for some people this service could be good enough, as they would save the trouble of walking through the aisles and waiting in line to pay (Kämäräinen, The reception box impact on home delivery efficiency in the e-grocery business, 2001). This is the easiest method and the one that requires less investment. A McKinsey report (Galante, García López, & Monroe, 2013) indicates that Europeans are well-disposed towards store pick-up, since they don't like to wait at home for deliveries. It also points out that in-store pickup would operate with a margin 30% higher than home delivery. Moreover, it's not affected by scale as much as delivery is or size of the orders.

Click-and-drive

Commonly known as "click-and-drive", customers place the order online and collect it at a designated pick-up point. This can be an independent location, or an attachment to an existing outlet (Colla & Lapoule, 2012). This model has become extremely popular in France (Ecommerce News, 2014). The first ones can extend the company's reach, when located outside the radius of existing stores, targeting new customers and trying to increase market share. In contrast, attached drive-ins purpose is to boost customer loyalty, with the inherent risk of cannibalizing sales from the store. For this reason, Colla & Lapoule (2012) label independent ones as "aggressive strategy" and attached ones as "defensive strategy".

The Eroski Group began their "Click&Drive" service last year, by opening the first pick-up point in the Leioa's hypermarket (Bizkaia). It's a free service and

consumers can pick-up their order after just 5 minutes of placing it with a computer, phone or tablet (www.alimarket.es, 2014)

Table 2. E-grocery delivery characteristics

| | Home delivery | Pick-up |
|---|---|---|
| In-store picking | STORE TO HOME | CLICK-AND-COLLECT |
| | Use existing stores to supply online shoppers | Online shoppers collect goods at grocery stores |
| Warehouse picking | WAREHOUSE TO HOME | DRIVE-THROUGH |
| | Delivery from warehouse | Collect the order at warehouses |

Source: A.T. Kearney analysis

Third-party pick-up location

This option is especially interesting for companies in need of a physical presence, by taking advantage of a partner's existing network. This alliance can be good for both companies: the online retailer can profit from an established network and distribution facilities, and the physical retailer can add another service and increase sales from customers entering the store to pick-up their online order. Amazon's previously discussed lockers would be a hybrid between this and unattended home delivery system (Cook, 2011).

FreshDirect delivers to office parks and train stations (Hays, Keskinocak, & Malcome de López, 2005), giving more options to customers, who can pick up their order at work or on their way home.

> *"Players work hard by developing different kinds of solutions for reaching better home delivery and picking efficiency. In the future, there will probably be many different kinds of alternatives for receiving the goods depending on customer preferences and willingness to pay for the service" (Kämäräinen, 2001)*

Delivery to car

The newest addition to the delivery options is the car delivery. This model allows for the customer car to act as a delivery point. Different companies, such as Volvo, Audi (in conjunction with Amazon and DHL) or the startup Cardrops have developed their own take on this system.

By using geopositioning, the delivery company is able to track the car, and recorded information about its position allows to see the patterns of use for each customer. When the car is located, the car trunk is opened remotely, so the delivery guy can drop the package. For customer security, one-use digital key are used, that expire just after the delivery has finished.

This model adds an extra point to customer convenience, since most people leave their cars parked for many hours while they are working, what makes it an almost perfect delivery point.

On the other side, customers may be wary of letting their car open to a stranger, though this barrier may be overcome with time (as it happened with electronic payment). The car also requires a no-key opening system, which only modern and high-end cars have nowadays.

**Distribution**

While deciding on the delivery model is important, distribution and fulfillment are no less essential. We understand this concept as the way the customer order is fulfilled and how the chosen items are packed and sent. We will distinguish between three different solutions.

Distribution centers

This approach revolves around the construction of warehouses to store the products arriving from the different providers, and pick the items directly from there. The vans with the customers' orders operate from these warehouses. Companies usually opt for really big warehouses to cover large areas, and this way benefit from economies of scale and reduce possible inventory problems.

High automation of the processes can contribute to lower labor costs and a much faster picking process. Furthermore, deliveries from supplier are cheaper because they are centralized to a single location in larger quantities (Hays, Keskinocak, & Malcome de López, 2005). In contrast, deliveries to customers tend to be more expensive, since large warehouses need to be built in distant areas.

This is the preferred option for most pure online retailers, since it removes a step in the supply chain, thus decreasing costs, and in addition can offer fresher products (Boyer & Hult, 2005). However, it has the disadvantage of needing a large initial investment, since this warehouses tend to need a high level of automation and technology, and higher inventory level to achieve the same level of service (Beamon, 2001). Also, the economies of scale need a large and constant volume of orders to become efficient, and hence it's risky for new unknown companies, with no customer base. As Kämäräinen (2003) specifies: "If demand and capacity utilization varies significantly, cost savings cannot be realized with automation". Overlooking this challenge provoked the bankruptcy of many companies in the early 2000s.

Fulfillment from existing stores

This distribution model is limited to companies with a physical presence of grocery retailers. Doesn't require a large investment upfront, what is really beneficial, since it allows companies to adapt over time to varying circumstances, instead of being constrained to a rigid facility. And considering that this market it's still in the first stages of development, it stands as the most cautious option, also by allowing to experiment, what can help tremendously to a longer-term success.

The process starts with teams of people who pick the items from the stores, according to the orders received through the internet, and then are moved into the vans for delivery to customers. This works better for lower volumes despite

of suffering higher costs per order (Delaney-Klinger, Boyer, & Frohlich, 2003). The comparison between these two models it's very similar to the classic fixed costs vs. variable costs problem.

Because of the chance of leveraging assets and lower entry barriers, most supermarkets have opted for this model. As Boyer and Hult (2005) point out, "the most successful online grocers to date (…) have all chosen to pick grocery orders at existing stores".

> *"The advantage that we have vs. a centralized fulfillment model (favored by Webvan and other online-only grocers) is that we're not building the multimillion-dollar structures. We are making use of existing structures, existing resources and technologies, and adding the Web front end to it" Matt Mutta, Vice President of Technology at Albertsons*

Still, this procedure has some drawbacks. As variable costs are higher, scalability and profitability in larger volumes becomes a problem. Congestion in the stores can also affect negatively both in-store and delivery services (Hays, Keskinocak, & Malcome de López, 2005).

Hybrid store-warehouse

This model involves delivering products from both stores and distribution centers. It can be thought as an evolution of the previous two, as it combines the best of both worlds. Deliveries from stores can be used to expand the reach of the distribution chain on lower-density areas, where a distribution center would not be efficient; and those distribution centers can be limited to high-density areas where the order volume is high and stable enough to compensate for the large investment.

Even though big supermarket chains favored in-store picking while on their introduction phase, many of them, such as Sainsbury's, Peapod or Albertsons suffer its poor scalability and are interested about the benefits of this hybrid model. These companies often already use distribution centers to supply products to the stores. Using the distribution centers for both store supply and customer deliveries allows for more efficiencies such as risk-pooling (demand fluctuation is reduced by aggregating store and customer demands), reduced inventories, stock-outs; apart from freeing the stores with more traffic (Beamon, 2001). Managers at Asda and Sainsbury's highlight the importance of avoiding conflict between channels.

However, this approach requires a deeper integration and more complex management in the distribution center/warehouse, since forces to work at different levels: large quantities for store delivery, individual items for online delivery.

**Failure of the first generation of online grocers**

The business model followed by most of the grocery e-retailers in the end of the 1990s and early 2000s was based on selling the products online and delivering them to the customer houses from large warehouses. The supply chain would be

shortened by the bypassing of physical supermarkets, but extended again to every customer's home.

As indicated previously, the critical point for this business may be sales per geographical area. Hence, it's not only important to get sales, but also to get them from specific locations. And as bigger the initial investments are in order to cover more and more area, sales need to be incredibly high just to break even.

This was the biggest mistake of Webvan. Though largely forgotten, Webvan was the most important online grocery business at the peak of the dot-com bubble. After attracting hundreds of millions of dollars from venture capitalists, the company worked on a fast-expansion model, investing all its capital on warehouses with high-automated fulfillment robots and delivery trucks. At its peak, served on as much as 10 cities, and had plans to expand delivery to 26 cities (Ramalingegowda, 2014). This overly ambitious plans were coupled with a management team with no experience in supermarkets whatsoever.

Of course, the company was too optimistic in thinking they could achieve a number of customers that could make profitable those colossal investments. After only 5 years after its foundation, Webvan declared bankruptcy in 2001. A similar case occurred in Miami, where PublixDirect, subsidiary of Publix Supermarkets, launched its services. After two years, had to close because the actual demand for the area was lower than expected, and thus not profitable.

However, the collapse of these companies doesn't mean that the business model is totally hopeless. A good example is Ocado. This British company has travelled through a long road since its foundation in 2000, but finally in 2015 has become profitable (Butler & Monaghan, 2015). The number of shoppers has climbed up to 453.000, with a remarkable average spending of £112.25 per order. Ocado took a much slower approach, focusing on just one manually-operated facility located in Hemel Hempstead, refining the processes before building an automated facility in Hatfield. They also served smaller areas, just North and South London in the beginning.

The best example for their progressive expansion mindset is Hatfield's facility (Boyer, Frohlich, & Hult, 2005). The design was made so it could open in 3 phases:

1. Constructing the entire facility, but only finishing 2 out of 3 bays. Bay 1 will be used for order picking and bay 2 for packing outbound orders and receiving inbound orders
2. Finish bay 3, where packing activities will be moved. Installing automated cranes and trolley systems to operate at larger volumes
3. When the sufficient volume of orders is attained, picking will be diverted into bays 1 and 2 (refrigerated items at bay 1, ambient items at bay 2), and outbound packing and inbound receiving will be held at bay 3.

Ocado's strategy has enabled them to be the only successful online retailer in Europe.

> *"The retailer's impact is far broader than merely being in the right place at the right time. In terms of technology, service and positioning, Ocado has not only led the sector - most notably in fulfilment where orders delivered on time are now running at 95% and item accuracy at 99% - but it has forced its rivals to step up their game." Chris Brook-Carter, Editor-in-Chief of RetailWeek*

**Development of multi-channel alternatives**

But the emergence of online pure-players showed brick-and-mortar retailers that consumers were interested in this new way of buying groceries. And after the collapse of most e-grocers, these companies launched a second generation, often acquiring previously failed companies, and combining the strengths of traditional and electronic commerce (Tanskanen, Yrjölä, & Holmström, 2002)

> *"[The internet] is a different channel, and it is not easy to make money in it. We didn't necessarily want to be the first ones in it, and until we saw GroceryWorks, we had not seen a viable model for it" Debra Lambert, Safeway spokeswoman*

The fact that established retailers already possess an efficient logistic system and a loyal customer base might be the edge that turns online sales profitable (Hays, Keskinocak, & Malcome de López, 2005), since entry barriers are very difficult to overcome for new players in the market. This has initiated a wave of acquisitions and partnerships, like Royal Ahold with Peapod or Safeway acquiring Groceryworks. On the other hand, some companies like Albertsons or Tesco decided to build those capabilities internally.

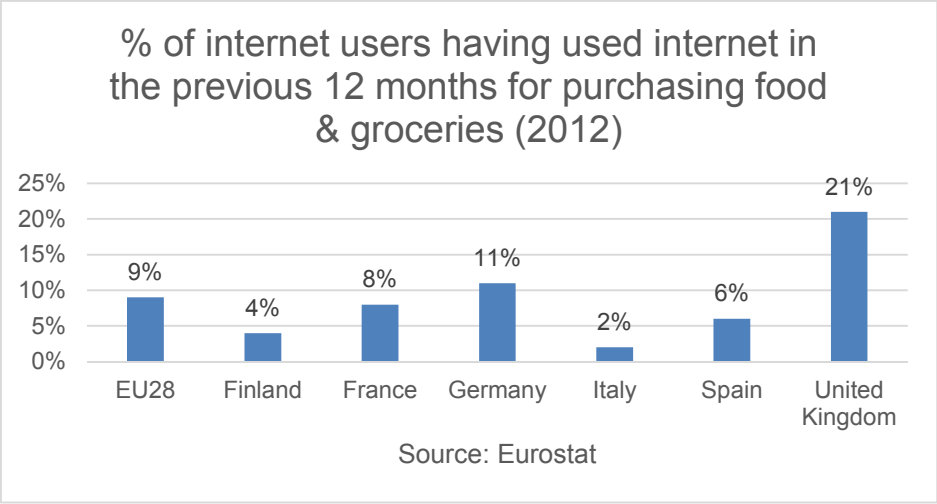
The brick-and-mortar success has been more prevalent in Europe, where Ocado is the only successful pure player. In contrast, the US market has many online-only companies competing in the market (SyndicatePlus, 2014).

Table 3. Worldwide e-grocer overview

| | Country | System | Online operations start | Current status |
|---|---|---|---|---|
| Webvan | USA | Pure e-grocer | 1999 | Bankrupt in 2001 |
| Streamline | USA | Pure e-grocer | 1992 | Parts sold to Peapod in 2000, and the rest ceased |
| Peapod | USA | Home delivery turned e-grocer | 1989 | Acquired by Royal Ahold in 2000 |
| HomeGrocer.com | USA | Pure e-grocer | 1997 | Sold to Webvan in 2000 |
| FreshDirect | USA | Pure e-grocer | 2002 | Currently covering New York and Philadelphia |
| Albertsons | USA | Supermarket chain | 2002 | Was shut down on 2006 |
| Safeway | USA | Supermarket chain | 2000 | Merged with Albertsons on 2014 |
| Ocado | UK | Pure e-grocer | 2000 | £948.9 million revenue |
| PublixDirect | USA | Supermarket chain | 2001 | Ceased online operations in 2003 |
| AmazonFresh | USA | Pure e-grocer | 2007 | Offering services at limited areas of USA |
| Tesco.com | UK | Supermarket chain | 2000 | Most profitable e-grocer |
| Sainsbury's | UK | Supermarket chain | 1995 | Available for 75% UK population |
| Waitrose | UK | Supermarket chain | 2011 | Online sales growth of 40% (2013) |

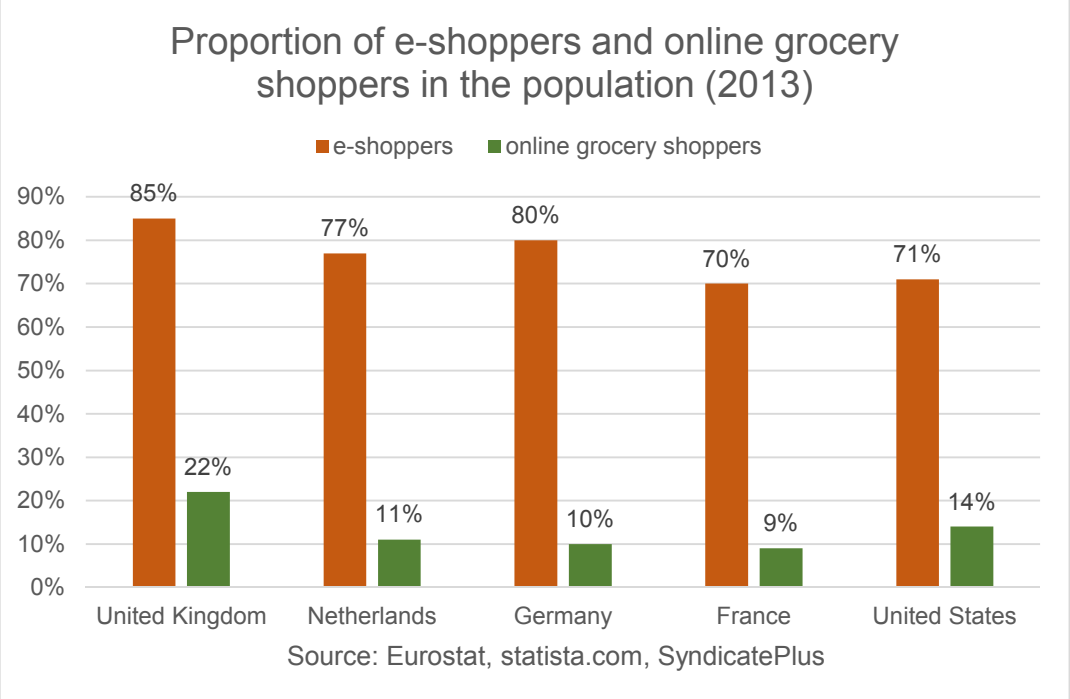
## A market with future

Even though it poses many challenges for new and existing companies, many authors and studies defend its long-term profitability. McKinsey's study (Galante, García López, & Monroe, 2013) reveal that in France, 33% of consumers who never bought groceries online, would do it if it were available in their area. In Spain, that number spikes up to 49%. The maturity of the market is motivating retail behemoths like Amazon or Walmart to position themselves and probably increase competition even further in the coming years.

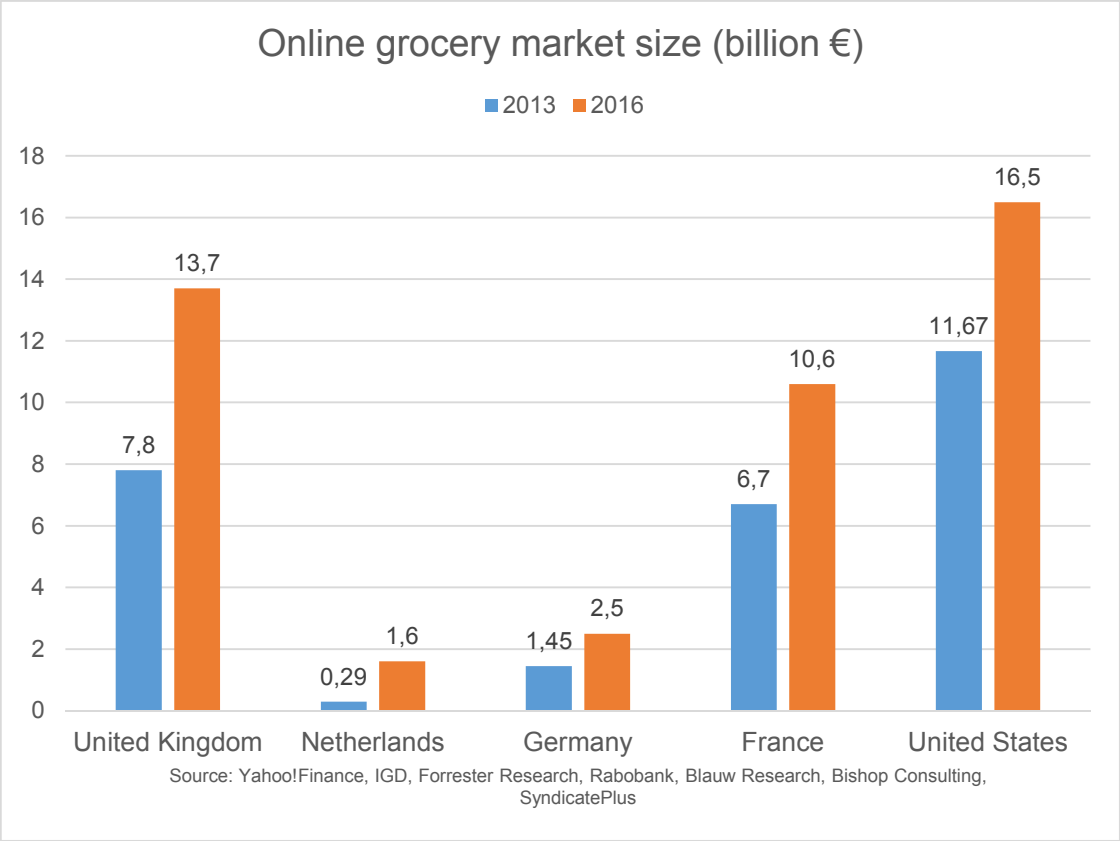



Graph 9. Internet users and food purchase

The UK market has been especially successful, as Eurostat data shows, as customer use online ordering at a much higher rate than other European countries. Tesco and Ocado, among others, have spearheaded this change. The Guardian (Smithers, 2013) predicts that online sales will double by 2018. This achievement can be related to the progressiveness of consumers in UK, high competition and great industry experience (SyndicatePlus, 2014).




Graph 10. E-Grocery shoppers in Europe




Graph 11. Online grocery market size

While the grocery market is a very slow one, as well as especially reticent to changes, most companies have assumed that, for good or bad, online commerce is going to be a big part of the business in the future. The challenge will be to design a model capable of being profitable in different regions and for consumers with different needs, as well as introduce the more hesitant part of the population to make use of these distribution possibilities.

## Conclusions

Multi-channel distribution and e-commerce are key in understanding the changes on the business environment in the last years, but also to anticipate how commerce will continue evolving and transforming itself, where mobile commerce and multi-channel integration appear to have an important role.

With the irruption of e-commerce, some anticipated the death of stores and brick-and-mortar retail. This paper tries to show that the new supply chains and distribution channels are not a revolution, but an evolution of the old ones, adapting to the new circumstances. It is equally important to comprehend the new approaches and practices and how these integrate and interact with the more traditional ones, for it is this synergy and cooperation what will define it.

Maybe this new approach means the end of stores understood just as a place for choosing and buying products; as they are now expanding its functions, using them as showrooms, customer service centers or means to offer additional services unavailable through other channels. In the end physical stores are far from dead and evolving to meet new customers' expectations, acting less as autonomous selling points and more as connected instruments, dependent of a cohesive strategy.

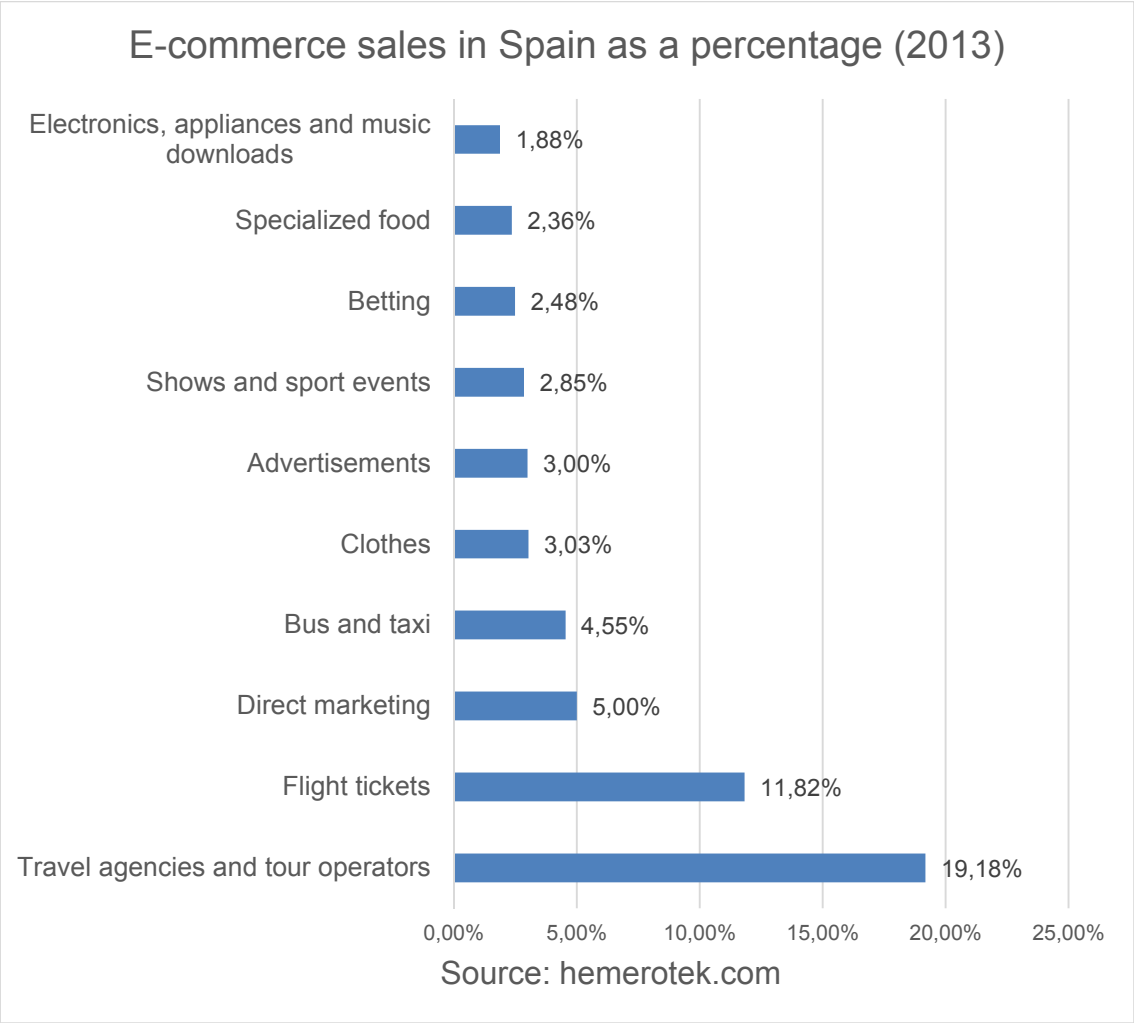
As companies and their functions become less concentrated and more reliant on transactions and relationships with other companies, conflicts between partners are likely to happen. This may be one of the most important obstacles to overcome for companies operating under these conditions. E-commerce has been a source for these conflicts in the last years, and it will presumably continue, as the lines between manufacturing and retailing are blurring even more.

The grocery market has been more distanced from these transformations, but as analyzed on this paper, the online channel is slowly making its way and pushing through the many obstacles that arise in a market as demanding as this one. At this moment, we are in a phase where multiple companies are experimenting with different approaches and methods, trying to adapt them to the needs and wants of customers, but also keeping in mind that the establishment of a new channel will be a long process, and shouldn't compromise the profitability of the company as a whole. For that reason, companies not only need to figure out distribution and delivery solutions that work for the customer, but also can be integrated efficiently with the ongoing procedures.

It's worth noting that the evolution of these markets are connected to the societies and regions established in. While we see major breakthroughs and profitable models in countries like UK, doesn't mean it can be applied to every market. Factors like customer density, culture or schedule can have a big impact in a business whose profitability requires a great deal of precision and efficiency.

Furthermore, Spain as a country has been more reluctant to adopt new distribution models. While online sales are rising, these are mostly limited to specific products or services, such as tickets for flights, concerts, and other forms

of transportation, Online sales for groceries in Spain are still low, and only specialized food products have taken some impulse.




Graph 12. E-Commerce sales in Spain

But even at a low adoption speed, the market is growing steadily and it could give companies an edge over their competitors in the following years, if they are up to the challenge. Giving an added value to customers while providing an easy and safe experience, in order to compensate the inherent reservations of the Spanish market.

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