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Platformization in Europe

Global and local digital intermediaries in the retail, taxi,
and food delivery industries

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1 INTRODUCTION

Digital platform companies have transformed many major European industries, such as mobility services, retail, tourism, finance, food, music, and digital games. Using a mix of digital communication technologies, technological infrastructures, data, AI, and sharp business practices, these companies have established themselves as new market intermediaries that match supply with demand. In many cases, this has increased the total size of the market, opened up market access to new suppliers, including small firms and self-employed individuals, and weakened the power of incumbent firms.

Yet, the flipside has been that platform companies have become powerful actors who set the rules of the game in their markets. In particular, some markets are dominated by giant global platform companies, which sometimes introduce rules and business practices that may diverge sharply from established European practices, such as collaboration between social partners.

Platform companies' power can benefit consumers and firms, as when they enact widely-used standards that create efficiencies, and when they combat fraud and malpractice. It can also change business practices in industries in ways that have both positive and negative consequences, as when labour practices are changed from regular employment to extensive use of self-employed contractors. And it can have consequences that are purely negative from the point of view of consumers and firms, as when a platform company uses its power to exclude competition and extract monopoly rents. Platform-based industry transformation, or "platformization", is thus an urgent topic for industries and policy makers to understand.

However, platformization has not proceeded in a uniform way across industries and countries. Some industries now rely on digital platforms to a significant degree, while others don't. Industries and countries also vary in the nature of the platforms that have become pervasive. An industry that is highly reliant on multi-national platforms in one country might not be so in another country. In other markets, home-grown European platform companies have been more successful, which may have different implications for incumbent industries.

The purpose of this study is to produce insights on why platformization varies so much across different industries and countries. To do this, we examine the platformization of three industries across different European countries, focusing on retail, taxi, and food delivery. We examine what causes could explain the different outcomes in these markets, and whether any common factors can be identified that would provide a more general theory of industry platformization. The results are intended to help policy makers, industry associations, and trade unions in understanding and developing responses to platformization (or the lack of it) in their industries.

2 TWO FACETS OF PLATFORMIZATION

Platforms are digital intermediaries between users, which involve both technical infrastructure and organizational elements (Gawer, 2014; EC, 2016a). Platforms are known as "two-sided" or "multi-sided" markets when multiple different types of users are brought together by a platform operator to facilitate interaction, such as exchange of information or commercial transactions (Kenney & Zysman, 2016; EC, 2016a). Depending on a platform's business model, users can be for instance buyers of products or services, producers, sellers, advertisers, or software developers (EC, 2016a). Platforms can be categorized into (1)

transaction platforms, which create value by facilitating transactions (eg. Uber, Google Search, Amazon Marketplace), (2) innovation platforms, which create technological core structure for further digital innovation (eg. app stores and software development ecosystems), and (3) integrated platform companies, offering both transaction and innovation platform products by leveraging further synergies and scaling effects (eg. Amazon, Google and Apple) (Gawer, 2014; Evans & Gawer, 2016; Parker et al. 2016). Very few innovation platforms and integrated platforms in large-scale use today originate from Europe; in contrast, there are many examples of successful European transaction platforms (Evans & Gawer, 2016). To allow for comparisons of platformization driven by American vs. European-born platforms, in this paper we mainly focus on transaction platforms.

The term platformization is used to refer to a process through which people and firms transact products and services increasingly through platforms without relying on offline intermediaries like physical marketplaces or shopping malls (Van Dijck et al., 2018). The term has also been used to refer to active efforts of platform companies to insert themselves as go-betweens in transactions that were previously unmediated (Tiwana et al., 2010). In this sense, platformization characterizes the process in which a platform company becomes a gatekeeper for access and interaction opportunities centered around a core bundle of services (the platform) within an ecosystem of consumers, suppliers, and other stakeholders. Through platformization, competition shifts from between individual firms toward competition between platform-centric ecosystems (Tiwana et al., 2010).

Digital transaction platforms and their economic and infrastructural elements have penetrated into, for instance, the retail and taxi industries, affecting the production, distribution, and circulation of products and services in these industries (Nieborg & Poell, 2018). Yet, not every transaction in these markets is mediated by a platform; many transactions continue to happen outside digital platforms, in brick-and-mortar retail stores and at street corners. Thus we can speak of the degree of platformization of a given market: the share of transactions in the market that is mediated by platforms, instead of established channels.

Platformization raises many questions for policy makers and incumbent firms. On the one hand, platformization can generate significant efficiencies and increase the total size of the market (EC, 2016a). On the other hand, a high degree of platformization can mean that the platform becomes a powerful new intermediary and rule-maker in the market (Evans & Gawer, 2016). A high degree of platformization can also entail significant changes in business practices, labour relations, and the position of the consumer (Tiwana et al., 2010). Yet, the degree of platformization across industries and geographic markets is not even. The same industry can be highly platformized in one country and scarcely platformized at all in another country. Understanding the causes of such divergence would help policy makers, incumbent firms, and the platform companies themselves to adopt appropriate policies and strategies. This leads to our first research question:

RQ1: What explains differences in the degree of platformization between different European industries?

A second aspect of platformization that is essential for European policy discussions is that most large platform companies are US-based firms that operate globally (Evans & Gawer, 2016). There are also many European platform companies, especially early-stage startups (Brown & Mawson, 2015; Michael & Pearce, 2009), but these are typically much smaller in terms of market share and do not offer the kind of integrated product and innovation ecosystems mentioned above. This poses a number of challenges to European policy makers, including how to effectively regulate markets where foreign companies play such an influential role, and how to further promote European innovation (Ahmad & Ingle 2013; Brown & Mason 2014). However, the dominance of global platform companies is not uniform, with local platform companies playing a more important role in some European markets than others. Geographic markets thus

differ not only in the degree of platformization but also in the nature of platformization: the extent to which it is driven by local vs. global platform companies (locally vs. globally platformized). This leads to our second research question:

RQ2: What explains differences in the nature of platformization between different European industries?

Previous literature provides some possible answers to the above questions. One potential cause for divergence in both the degree and nature of platformization between different countries is regulation (Bostoen, 2018). Although the EU's Single Market entails a degree of regulatory harmonization between member states, significant differences remain for many sectors. Non-state regulations and soft law emanating from industry associations and collective bargaining in the labour market also differ between European countries. In turn, global platform companies have a history of successfully shaping regulation (Uzunca et al., 2018) or simply working around it (Nash et al., 2017). As a result, platform companies may even benefit from regulation when it keeps traditional competitors at bay (Gillespie, 2010). It is therefore not obvious whether and to what extent regulation can explain divergence in platformization across European countries.

Another possible explanation is differences in market size. While most platform markets tend towards winner-take-all scenarios or oligopolies due to network effects, markets may be too small for critical mass to be reached for any one platform company (Evans & Schmalensee, 2010; Schilling, 2002). In the telecommunications industry it is well understood that a telecommunications platform needs to achieve a "minimum efficient scale" to be economically viable (Nam et al., 2009). A smaller country or countries with fragmented domestic markets may not present a large enough market for a platform company to run a viable business, explaining country differences in the degree of platformization. It is also possible that the minimum efficient scale is smaller for local platforms, because they enjoy home market advantages such as better information, resulting in lower operating costs. This could explain country differences in the nature of platformization.

A potential related explanation is differences in the penetration of information and communication technologies, such as Internet connectivity and mobile devices. The absence of these technologies in a country in effect diminishes the addressable market size for a platform and makes it harder to achieve the minimum efficient scale. However, the role that technology adoption plays for platformization is indirect; for instance, the United States ranks number 16 in the ITU ICT Development Index, behind many European countries (ITU, 2017), and yet has some highly platformized industries, as well as being home to many leading platform companies. Notably, technology adoption varies by industry and value chains, where firms in some industries are highly digitized in terms of their operations, and thus more ready to integrate operations with digital platforms, than firms in some other industries (Zhu et al., 2006).

Platform markets exhibit network effects, which in the simplest case means that, the greater the number of users a platform has, the greater its value to each user (Katz & Shapiro, 1985). These so-called positive direct network effects mean that new users tend to pick whichever platform is the largest, giving the first mover platform a significant advantage (Klemperer, 1987). Thus countries where the first mover is a local platform are more likely to remain locally platformized, and countries where the first mover is a global platform are more likely to remain globally platformized. Whether the first mover in a country is a local or a global platform is not arbitrary. Countries with a strong entrepreneurial ecosystem and existing technology industry clusters are more likely to give rise to local platform companies that go on to capture markets before global platforms enter or to effectively compete with them. Differences in the strength of entrepreneurial ecosystems and technology industry clusters could thus explain country differences in the

nature of platformization.

Besides positive network effects, platform markets can also have negative network effects, also known as congestion (Parket & Van Alstyne, 2005). For instance, a high number of consumers on a food delivery platform makes the platform more attractive to restaurants, but possibly less attractive to other consumers, because it can increase waiting times. The magnitude and direction of these network effects can vary across industries, explaining why some industries are more readily platformized than others. It is possible that the magnitude of effects can also vary across countries; for instance, food delivery congestion might happen more easily in a country where restaurants are smaller and not designed to suddenly fulfil lots of orders on demand. Differences in congestability might thus explain country differences in the degree of platformization.

3 METHODOLOGICAL APPROACH AND DATA SOURCES

Our overall methodological approach is an industry-by-industry cross-country comparison, followed by a cross-industry analysis. In other words, for each selected industry, first we examine how the industry has “platformized” in different countries. We then analyse the industries together to understand to what extent underlying causes could plausibly explain country differences across the industries. We do this analysis for both the degree of platformization (RQ1) and the nature of platformization (RQ2). The outcome is an understanding of what factors shape platformization across industries and countries.

The industries selected for this analysis are retail, taxi, and food delivery. These industries were selected because they are important industries known to be significantly affected by platformization. Retail is one of the largest European industries and one affected by platformization early on, as e-commerce platforms such as Amazon entered Europe. The taxi industry is well-known for having undergone rapid transformations in many—but not all—countries as a result of the introduction of platforms such as Uber. The food delivery industry has seen similar rapid transformations slightly more recently, and is now considered a “key” or “essential” industry in countries suffering from the COVID-19 pandemic.

The data we use to quantify the degree and nature of platformization across industries and countries is drawn from secondary sources, mainly market analysis reports, government reports, and academic literature. All sources are cited in the sections below. Since no data source provides a comprehensive overview of platformization across any industry or geographic market at a given point in time, we evaluated and combined different sources to produce synthetic overviews that match our scope. Conceptual and methodological variations across the data sources introduced uncertainty into the analyses and in some cases meant that judgment calls based on qualitative assessment were required. As a result, although we present quantitative details such as country market shares, we summarize the findings as qualitative clusters of countries sharing similar platformization characteristics.

The countries included in the analyses are the UK, Germany, France, Italy, Spain, Poland, Netherlands, Sweden, Ireland, Romania, Hungary and Greece. The country selection was guided by membership in EU-28, market size, variation in platformization characteristics, and data availability. We tried to analyse all these countries for all the three industries, but in some cases there was insufficient information on a country in a given industry, in which case it was excluded from the analysis.

4 PLATFORMIZATION OF THE RETAIL INDUSTRY ACROSS EUROPE

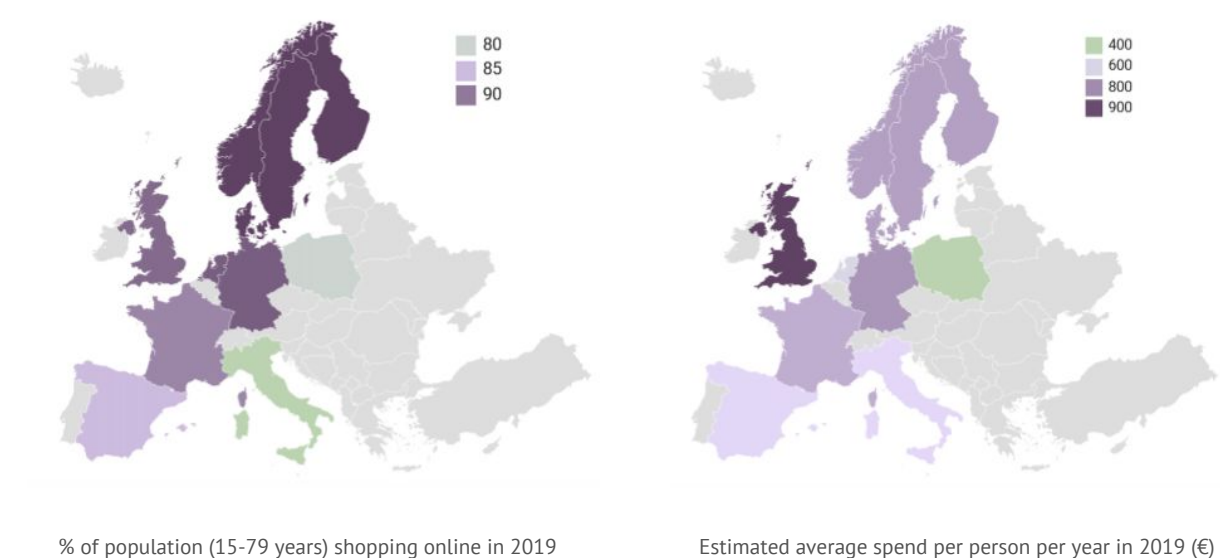
4.1 The retail industry in Europe

Retail is a very large industry in Europe, with a total market size of about €3.25 trillion in 2018 (O’Connell, 2020). It can be defined as the part of the economy where businesses sell goods to consumers for their own use¹ (Eurostat, 2008). The retail industry remains competitive across Europe. There are no dominant retail or wholesale companies on a global, European, or national scale, even within specific product categories. Larger retailing and wholesaling firms benefit from scale efficiencies, but proximity to consumers is important and customer needs vary from location to location (OXIRM, 2014).

4.2 Platformization of retail

The retail sector in the digital economy is benefiting from lower transaction costs, higher productivity, and the enhanced capability for innovation. (OXIRM, 2014). The most important sales channels in the retail industry are typically brick-and-mortar storefronts. Other channels include mail order and direct sales. Since the 1990s consumer Internet boom, it has also become increasingly common for consumers to make retail purchases by ordering goods through the web, and more recently, through smartphone apps. This has variously been termed online shopping, e-tailing, and e-commerce. Approximately 286 million European consumers shopped online in 2018, and total European spending on B2C e-commerce was estimated at €621 billion in 2019, growing at an annual rate of around 13% (EC, 2019). The share of retail industry revenues coming through e-commerce was estimated to be around 20% in the UK in 2019 (ONS, 2020). In other European countries, the share is likely smaller (OXIRM, 2014). Figures on selected countries are presented in Figure 1.

Figure 1. E-commerce market statistics in selected European countries (PostNord, 2019)



E-commerce sales channels can be broken down into two broad types. The first type is retailers’ own digital channels, such as when a retail chain sets up a website with its own branding where consumers can place orders for home delivery or in-store pickup. The second type of channel is online marketplaces, or

¹ Other definitions also include consumer-to-consumer sales in retail as long as the purchasing party is the end-user, but in this study, we focus on business-to-consumer (B2C) retail. Goods sold in retail include consumables such as clothing and cosmetics, household equipment such as furniture and electrical appliances, and cultural and recreational goods such as books, games, and music recordings .

e-commerce platforms. On these websites retailers and their goods are listed alongside other retailers in the same category, allowing consumers to do comparison shopping. The largest e-commerce platform globally is Amazon Marketplace (henceforth Amazon). Though Amazon is based in the U.S., about 19% of its revenues come from the two largest European markets, UK and Germany, and it has a significant presence in many other European countries as well (Amazon, 2019).

The platformization of the retail industry thus entails retailers' reliance on e-commerce platforms such as Amazon and eBay as sales channels for their goods. The degree of platformization is thus the share of revenues obtained through e-commerce platforms compared to retailers' own channels. Data collected by Eurostat for the European Commission suggests that European enterprises were more than twice as likely to be selling through their own website or app than through an e-commerce platform (Eurostat, 2017). But the same data shows that the enterprises earned 1.58 times more revenues through e-commerce platforms than their own websites and apps. Therefore it appears that the industry is already platformized to a significant degree.

However, retail platformization varies across different European countries, both in terms of the degree and the nature of platforms. For instance, Amazon's services are not available everywhere on the continent. The company's Amazon Prime service is only available in France, Germany, Spain, and the UK, with launches planned in the Netherlands and Belgium.

We investigated retail platformization across selected European countries, collating data from different sources on both the degree of platformization as well as the nature of the most popular retail platforms. Our findings suggest that the countries fall into three broad clusters: (1) globally platformized countries, where the retail industry is platformized to a significant degree, driven by the global leader Amazon; (2) locally platformized countries, where the retail industry is platformized to a significant degree, but mainly by local platform companies; and (3) non-platformized countries, where retailers' own websites and brick-and-mortar stores remain the most important sales channels by far.

Figure 2. Retail industry platformization countries



Cluster 1: Countries with a globally platformized retail industry

Countries that are “globally platformized” are those in which the retail sector is highly platformized, and platformization is led by global platform companies, mainly Amazon and eBay. Countries falling into this category are the UK, Germany, France, Italy and Spain.

The UK has the largest e-commerce market in Europe. British e-commerce sales reached €175B in 2018. Amazon UK was launched in 1998 and is the biggest retail platform in the country, with a turnover of €1.66B (£1.46B) and around 30% of market share in 2018 (Basul, 2019). It is followed by eBay UK, which was launched in 1999 and had a turnover of £200M in 2016 (Marriage, 2017). A significant local e-commerce company in the UK is ASOS, a large online-only retailer of apparel and cosmetics, which has its own website and mobile application. It was launched in 2000 and had a turnover of €2.3B (£2B) in 2017.

Similarly in Germany, the e-commerce market size is €65.1B in 2018 (Litchfield, 2020), the second largest in Europe following the UK. Amazon.de entered in 1998 and is now the dominant leader with a market share of about 50% (PostNord, 2019). The comparably large local company is Otto.de. It started its mail order in 1949 and launched its shopping website in 1995. Zalando is a German online fashion platform founded in 2008. Zalando supported European local taste by successfully digitizing the fashion industry and serving different trends and brands.

Unlike the UK and Germany, the French e-commerce market is fragmented rather than consolidated. One of the reasons is that French consumers are not decidedly price-sensitive for online shopping, which provides opportunities for SMEs. Still, Amazon.fr is the market leader; it launched in 2000 and generated revenue of €3.10B (\$3.35B) in 2018 (Montasell, 2020). Sizeable local marketplaces include Cdiscount.com and Vente-privee.com, both of which generated revenue over €2B in 2018 (ibid.).

Lastly, retail markets in Italy and Spain are similar in terms of the market size growing rapidly since the economic crisis (Postnord, 2019). In Italy, Amazon.it founded in 2001 is the market leader followed by Zalando.it. Consumers in Italy and Spain are highly price-sensitive for online shopping (ibid.). Consumption in these nations increased at Chinese e-commerce marketplaces such as AliExpress.com and Shein.com where cheaper products are available. In comparison, the largest Italian retailer Unieuro was founded in 1937 and 70% of its revenue in 2017 came from offline shops but only 10% from online.

A common feature of the countries belonging to the “globally platformized” category is that they are Europe’s biggest retail markets. They attracted Amazon and eBay early on, and these global platforms were able to generate scale efficiencies and compete successfully against local e-commerce companies. Along with the development of technology and logistics, global companies are able to take more advantage of increasing cross-border sales.

Cluster 2: Countries with a locally platformized retail industry

Countries that are “locally platformized” are those in which the retail sector is highly platformized, but mostly through local or European platforms such as Zalando. Countries falling into this category are Poland, The Netherlands and Sweden.

The e-commerce market size in Poland was €9.31B in 2018 (Ecommerce News, 2019). The ban on Sunday trading across the country which came into force in 2018 appears to push up e-commerce sales. Poland is

one of the countries with the lowest level of cross-border electronic transactions in the EU (Postnord, 2019), which may explain why localization is the key to success in the Polish market. Allegro, founded in 1999, is the biggest e-retailer with over 50% market share and a revenue of €3.06B (\$3.3B) in 2016 (Wilson, 2016). Its early entry ensured Allegro's competitive advantage over other global platforms or local competitors. The failure of eBay since its launch in 2005 combined with the dominance by Allegro may have led Amazon to not enter the Polish market yet. Still, the German Amazon website provides its service in the Polish language.

The largest share of the market in the Netherlands is also in the hands of local e-tailers. Over 250 Dutch e-commerce companies with at least €5 million in online turnover compose the fragmented Dutch market. Bol.com is the biggest Dutch e-commerce marketplace founded in 1999 and generated a revenue of €2.13B (\$2.30B) in 2019 (EcommerceDB, 2020). Amazon.nl launched in 2014 but has been selling only books, e-books and its e-reader Amazon Kindle. From 10 March 2020, the global giant has been selling everything and Amazon Prime service is available in the Netherlands.

Both countries in the “locally platformized” category commonly have medium-sized retail markets which give more room for local companies to dominate the market while remaining attractive to global companies. Interestingly enough, Amazon did not lead platformization in every country in Europe, especially in markets which are fragmented by regional logistics (Kansara, 2018).

Cluster 3: Countries with a non-platformized retail industry

Countries that are non-platformized are those in which the retail sector is not platformized to a significant degree. Romania and Greece belong to this category.

E-commerce in Romania holds 8% share of the total retail market. There are a few reasons why the Romanian retail market is not significantly digitalized yet. First, the preferred method of payment for Romanians remains the cash on delivery (Radu, 2015). In addition, Romanian consumers mistrust that the products presented on the online correspond to reality and fear of being cheated (ibid.). The market leader is eMAG, founded in 2001. Its turnover was about €1B in 2018, increased by 17.5% from the previous year (Dumitrache, 2019).

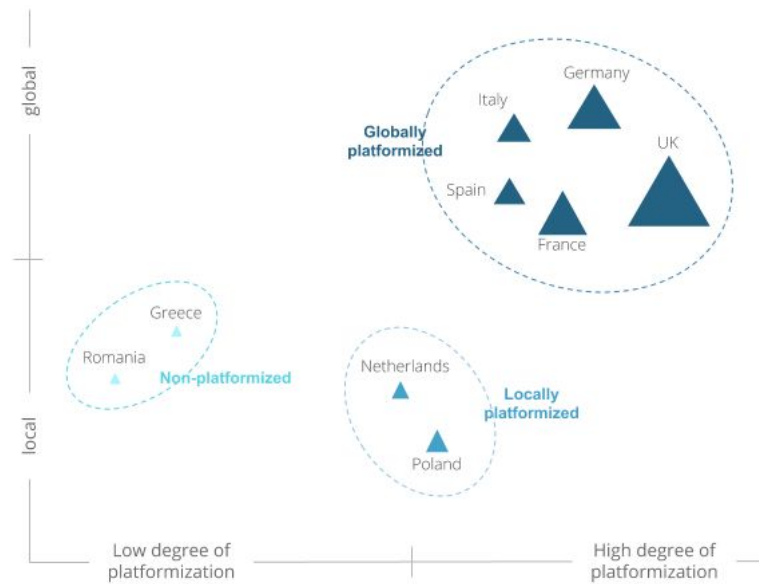
The share of retail companies selling online in Greece has fluctuated, peaking at 11% in 2018 (Schmid, 2020). Greek online shoppers make 80% of their purchases at domestic online stores (Ecommerce News, 2019). The rest of the market share is from Amazon.com and its third party merchants of which a combined value share of 12% (Lloyds bank, 2020). It is followed by eBay.com at 8%.

The countries in the non-platformized category share the prevailing aspects such as the lower development of internet infrastructure and the relatively small retail market size in Europe. These seem to rarely encourage global platforms to challenge these markets. However, the fact that the consumers in these countries are price-sensitive might provide opportunities for platforms that are able to generate efficiencies over incumbent firms.

Table 1: Retail platformization across selected European countries

Country cluster	Country	Global companies	Local/EU companies	Platform market concentration	Possible reasons
Globally platformized	UK	Amazon.co.uk (1998), eBay.co.uk (1999)	ASOS (2000), Fruugo (2006)	Strong	No big local online marketplaces until Amazon entered
	Germany	Amazon.de (1998), eBay.de (1999)	Otto (1963), Zalando (2008)	Strongest	Amazon established earlier than incumbent local companies
	France	Amazon.fr (2000)	Cdiscount (1998), Vente-privee (2001)	Weak	Cheap prices are not competitive. More chances for innovation and challenges
	Spain	Amazon.es (2011), AliExpress.com	El Corte Ingles (1940)	Strong (fragmented until Amazon dominated)	Spanish customers are sensitive to prices
	Italy	Amazon.it (2001), AliExpress.com	Zalando, Privalia, Unieuro, Yoox	Strong (fragmented until Amazon dominated)	The old and large local retailers are still selling mostly offline
Locally platformized	Netherlands	Amazon.nl (selling books since 2014, all items from 2020)	Bol.com (1999), Coolblue (1999)	Weak	Because of its dense population, many local online retailers are growing and they also have physical stores
	Poland	Amazon.de, Facebook marketplace	Allegro (1999), Zalando	Strong	The failure of eBay combined with the huge market dominance by Allegro and German Amazon's availability in the Polish language might have made Amazon hesitant to launch the Polish marketplace
Non-platformized	Romania	Amazon.com	eMAG (2001)	Weak	Mistrust of shopping online and preference of cash payments
	Greece	Amazon.com, eBay.com	e-Shop, Skroutz, Public	Weak	Relatively low internet penetration

Figure 3. Retail industry platformization clusters



*The size of triangles is proportional to the market size of a country

5 PLATFORMIZATION OF THE TAXI INDUSTRY IN EUROPE

5.1 The taxi industry in Europe

Taxis are defined as vehicle-based mobility services, moving customers from point A to B as requested (EC, 2016b). The taxi industry can be divided into the street segment where customers hail the taxis on the street or get on at predetermined taxi stands or ranks, and the pre-booking segment with private hire vehicles (PHVs). Passengers for PHVs reserve the service via a dispatch centre, traditionally by telephone (Aquila, 2011; Darbera, 2007; Schaller; 2006). PHV operators benefit from the scale efficiencies because of the cost of infrastructure for receiving orders and computing the booking allocation. In most countries, authorizations required for PHVs in the pre-booking segment are less stringent than acquiring taxi licenses. One reason for allowing the acquisition of PHV licenses easier is a higher fixed cost in the pre-booking segment than the street segment (Aarhaug & Skollerud, 2013). The main objective of taxi regulations is to reduce the inefficiency from the competitive pressure between taxis and PHVs and to create two different segments of the market serving distinct types of users (EC, 2016b).

The taxi industry is large in Europe, with a total market size of about €44.59 billion in 2018 (Statista, 2020a). The number of customers in the European taxi industry was approximately 151.7 million in 2018 (ibid.). The industry remains competitive across Europe. This industry is geographically fragmented and largely regulated by local authorities, so it should be analyzed on a country or local government level, if possible, to understand its complexity and regional differences. Figures on selected countries are presented in Table 2.

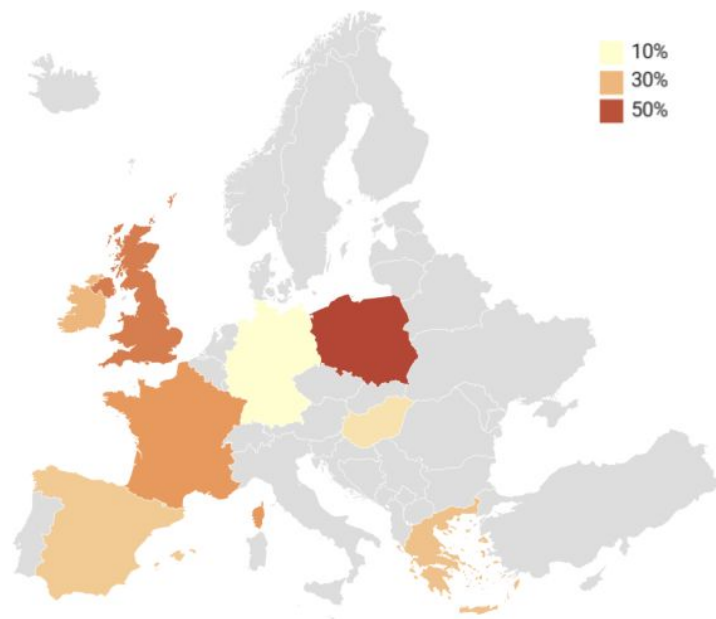
Table 2. Taxi market statistics in selected European countries (Swedish Taxi Association, 2018; Statista, 2020a)

Country	Users (M, 2018)	Regulation	PHV*	Taxi density** (2018)
UK	17.1	Strong	Strong	1.4
Germany	10.8	Strong	Strong (40%)	0.6
France	12.5	Strong	Strong	0.9
Spain	11.2	Strong	?	?
Ireland	1.34	Strong	None	?

*The significance of the private hire vehicle sector by country.

**Per 1K residents. The population size and density influence the street hail market size.

Figure 4. Online shares taxi industry



5.2 Platformization of the taxi industry

In this study, we understand the “platformization” of the taxi industry as the increasing dependence and usage on ride-hailing apps from both drivers and customers. The degree of platformization is thus the share of revenue obtained through e-hailing platforms compared to the incumbent taxi operators or dispatch centers. The share of taxi industry revenues coming through online channels in 2018 was 30% in Europe as a whole (Statista, 2020a). Therefore, it appears that the industry is already platformized to a significant degree, despite the regulatory blocks.

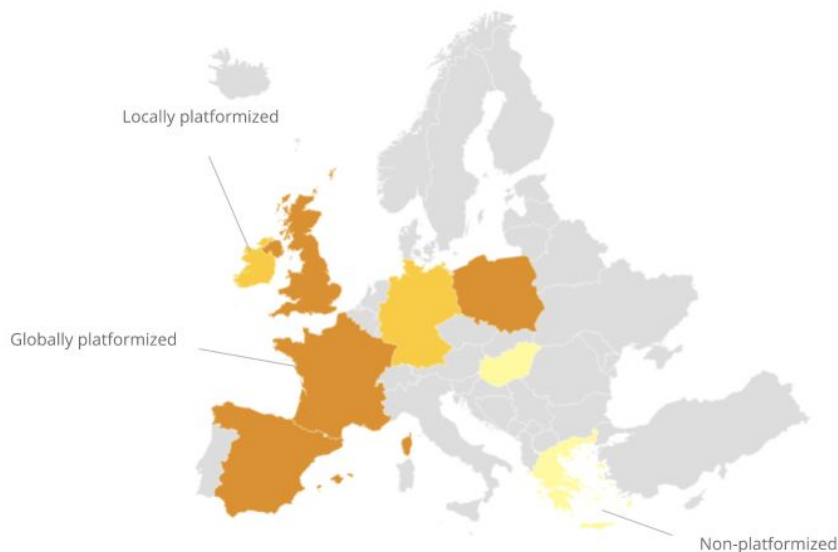
Taxi sales channels can be broken down into two types: online and offline. The first type refers to the use of taxi apps, also known as e-hailing, where passengers can hail a taxi around or connect online to request service. The second type of channel includes in-person street hail or waiting at a stand and telephone

pre-booking.

The largest ride-hailing platform globally is Uber. Since its launch in the US in 2010, it has become increasingly common for customers to book taxi services through smartphone apps (Mohd Idros et al., 2019). But compared to Uber’s dominance in the American market, its presence in European markets is more uneven. Uber’s business model exploits private vehicles as underutilized assets (Geissinger et al., 2020; Acquier et al., 2017). The drivers are neither employed by the firm nor licensed and use private cars or non-registered rental cars (Shead, 2019). In addition, PHVs on Uber do not comply with the rule of returning to dispatch centers but roam around streets, in contrast to their established competitors. These are considered as illegal operations in some European jurisdictions. At least nine European countries have banned or restricted some parts of Uber's operation.

Nevertheless, taxi platformization varies across different European countries, both the degree of reliance on platforms and the nature of the platforms. We investigated taxi platformization across selected European countries based on data availability on both the degree of platformization as well as the nature of the most popular taxi platforms. Similar to the platformization of retail, we found that the countries fell broadly speaking into three clusters: 1) globally platformized countries, where platformization is driven by the global leader, Uber; 2) locally platformized countries, where platformization is driven by platform companies based in the country; and 3) non-platformized countries, where phone booking or in-person street hailing remain the most important sales channels.

Figure 5. Taxi industry platformization countries



Cluster 1: Countries with a globally platformized taxi industry

Countries that are “globally platformized” are those in which the taxi market is highly platformized initially through a global platform such as Uber. However, the local or European platforms such as Free Now are overtaking the transformation since the local or national regulations have restricted Uber’s operation with

non-licensed vehicles. The UK, France, Spain, and Poland correspond to this category.

Uber launched in the UK in 2012 for the first time in Europe. 45K drivers and 3.5 million users were on the app in 2018 (Titcomb, 2017). Regulators in London have terminated Uber's license to operate, citing irregularities in screening drivers and reporting serious criminal offenses (DW, 2019a). British labor court ruled in November 2017 that Uber drivers should be employed and to be offered a safety net. The second largest taxi app in London is Bolt, which launched as Taxify in 2011. Taxify was forced to suspend its services after TfL blamed the company's lacking PHV licenses to operate in the city (Field, 2017). However, Taxify successfully re-entered the market in 2019 under its new name, adapting their operations to new regulations (Lanxon, 2019). Bolt worked with 30K drivers and served 25 million customers in 2019.

In France, Uber launched in 2011. A law came into effect in January 2018, which forces all ride-hailing drivers to be legally licensed. This new regulation has constrained the rideshare market and as a consequence, the number of PHV drivers dropped. Uber was forced to rework its business model after facing the ire of French regulators (DW, 2019a). Taxify launched in France in 2017 and has been competing with Uber. Heetch, another PHV app targeting young people who want to get home from nights out and was forced to stop in 2017 after a trial by French taxi drivers opposing this company because the drivers on the app are not licensed (Dillet, 2017).

In Spain, Cabify is the market leader which was launched in 2012. The firm is a part of the Maxi Mobility Group and bought a Brazilian taxi platform, Easy Taxi in 2017. The number of rides increased by 100% in 2018 in a year (Betancourt, 2019). Uber launched in 2014 in Spain. Yet, traditional taxi drivers fiercely protested for banning Uber and Cabify from December 2019 and the new regulation came into force to restrict both firms nationwide.

The taxi market in Poland is highly platformized where the online share was 46% in 2018 (Statista, 2020b). The Polish government passed new legislation so that the ride-sharing firms are required to hire only licensed drivers from the beginning of 2020. It is followed by the licensed taxi driver protests against the operation with non-licensed vehicles of both Uber and Bolt in Poland earlier in 2019. Uber launched in 2014. Then, Bolt came after in 2017 in the country which is its largest market in the EU. Bolt served over 1 million passengers and worked with 30,000 drivers in 13 cities in Poland (Sienko, 2019).

A common feature of the countries belonging to the “globally platformized” category is that their taxi market is heavily regulated by local authorities. The quantity of licenses issued, the quality of drivers and the maximum fare are restricted in these markets. After facing regulatory pushback and having its initial operation with non-licensed vehicles being banned, Uber has lost its market share to local taxi operators and e-hailing companies. Thus, local e-hailing platforms dominate these markets even after Uber re-enters in compliance with regulations.

Cluster 2: Countries with a locally platformized taxi industry

Countries that are “locally platformized” are those in which the taxi sector is highly platformized, mostly through local or European platforms such as Free Now. Even though Uber launched in these countries, its operations were more harshly restricted by the local authorities from the start, halting the firm's growth. Countries falling into this category are Germany and Ireland.

In Germany, Free Now (previously Mytaxi) is the most popular taxi app. Its service is available in 11 European countries with 120K licensed taxi drivers (Accordino et al.). Daimler acquired Mytaxi in 2014

and Hailo was merged with Mytaxi over 2016 to 2017. However, several regulatory controls deterred Uber's growth in the German market. In early 2014, Berlin authorities ruled against Uber (Inc, 2014). Uber was banned to operate in Berlin due to safety concerns and pertaining to unregulated vehicles and unqualified drivers who are not properly insured. In 2015, a Frankfurt district court imposed a nationwide ban on UberPop, claiming that drivers do not have proper licensing and insurance (Rawlinson, 2014). Consequently, Uber limited its service to licensed drivers in 2015. Lastly, in December 2019, the Frankfurt court banned Uber from sending ride-hailing requests to rental car companies via its app with the court finding multiple competition violations (Lomas, 2019). Currently though, Uber does operate in 8 major German cities (Uber, 2020).

Similarly in Ireland, Mytaxi is the market leader operating in four cities for 16 million riders in 2018 (Marty, 2019). The local platform Lynk was launched in 2015, which worked with 2700 drivers in 2016 (Taylor, 2017). Uber's non-licensed operation was banned in Ireland since its soft launch in 2014 but its operation with non-licensed private cars was banned in 2017 (McGreevy, 2017).

In both countries in the "locally platformized" category, Uber was rejected by their traditional taxi markets and strict existing regulations, giving more room for local companies to emerge and take a share of the e-hailing market. These markets remain attractive for global platforms to re-enter with regulatory compliance. But local platforms can defend their position by taking advantage of their knowledge of local preferences and by already having compliant operations in place.

Cluster 3: Countries with a non-platformized taxi industry

Countries that are non-platformized are those in which the taxi sector is not very platformized. Hungary and Greece belong to this category.

In Hungary, the share of taxi industry revenues through online was less than 20% in 2018 with limited growth (Statista, 2020c). Uber launched in 2014 and it had over 160K riders in Budapest (Uber, 2016). However, Uber suspended its service in the country after new law blocked internet access to its dispatchers in 2016 because it breached regulations in the taxi market (Hawkins, 2016). Since the largest competitor's failure, Bolt became the most popular app in the country followed by City Taxi, a local yellow taxi which can be booked on apps like MyTaxi.

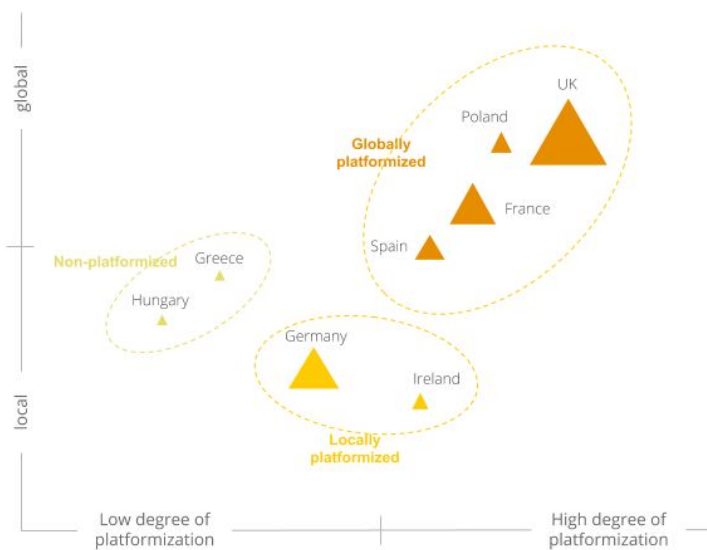
Similarly in Greece, around 23% of taxi industry revenues were generated online in 2018 and the share has not been remarkably growing since then (Statista, 2020c). Uber launched in 2015 in the country but suspended its service in 2018 (Hawkins, 2018). The local taxi app, Taxibeat, was founded in 2011 and was acquired by MyTaxi in 2017. The company was renamed to Beat and is currently operated by Daimler.

The countries in the non-platformized category share some common characteristics, such as less-developed internet infrastructure and relatively small market size in Europe. Even though these markets interest global and European companies by their growth potential, the local authorities tend to protect the traditional taxi drivers by raising the entry barrier.

Table 3. Taxi industry platformization across selected European countries

Country cluster	Country	Uber's presence	Local/EU companies	Reasons
Globally platformized	UK	Launched in 2012. Non-licensed operation was banned in London.	Bolt (Taxify 2017), Gett (2011), Free Now (Hailo 2011, Mytaxi 2016)	Largest market in Europe. Global companies remain competitive.
	France	Launched in 2011. Non-licensed operation was banned in Paris.	Bolt (Taxify 2017)	Global companies remain competitive.
	Spain	Launched in 2014. Nationally banned in December 2019.	Cabify (2011)	
	Poland	Launched in 2014. Non-licensed operation was banned	Bolt	
Locally platformized	Germany	Berlin and Frankfurt ruled it in 2014. Frankfurt re-allowed it in 2014 and banned UberPoP in 2015. Limited its services with only licensed vehicles since 2015. Operating in Dusseldorf since 2018 with licensed-drivers.	Free Now (Mytaxi 2009), Taxi.de	Stable traditional taxi market, strong regulations for the number of licenses can be issued and background check of drivers.
	Ireland	Soft-launched in 2014. Non-licensed operation was banned in 2017	Free Now (Hailo 2012, MyTaxi 2015), Lynk (2015)	Strong regulations for acquiring taxi licenses.
Non-platformized	Hungary	Launched in 2014 but banned in 2016	Bolt, City Taxi	Strong market regulations.
	Greece	Launched in 2015 but suspended in 2018	Beat (Free Now)	

Figure 6. Taxi industry platformization clusters



*The size of triangles is proportional to the market size of a country

6 PLATFORMIZATION OF THE FOOD DELIVERY INDUSTRY IN EUROPE

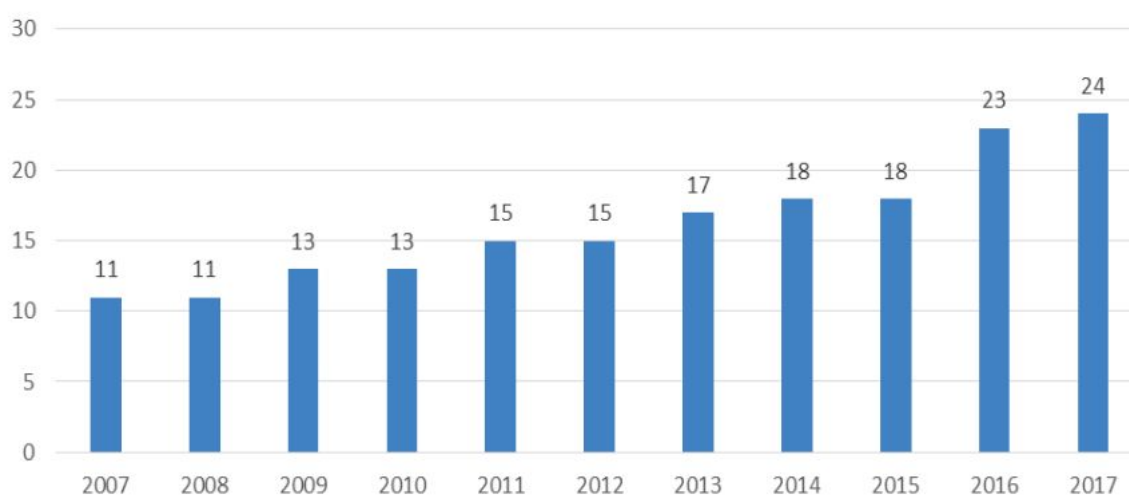
6.1 The food delivery industry in Europe

The changing demographics and preferences of urban consumers have resulted in increasing demand for different ways of purchasing food, including take-out and delivery. Food delivery can be defined as a courier service in which a restaurant, store, or independent food delivery company delivers food to a customer. Some consumers seek to obtain the versatility and variety of restaurants in the comfort and convenience of their homes and offices by using restaurant delivery services (Lau & Ng, 2019). Others seek to replace tiresome trips to stores with grocery deliveries. The COVID-19 pandemic has further intensified the shift towards delivery. The total turnover for restaurants and mobile food service activities² was €354 billion in the EU-28 in 2015, and they consisted of over 1.5 million enterprises employing 8 million people (Eurostat, 2008).

6.2 Platformization of food delivery

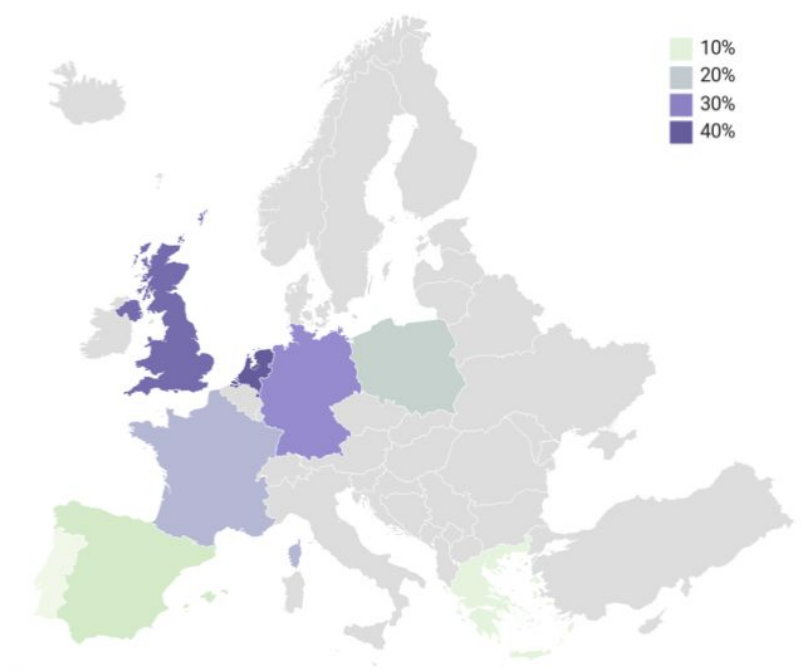
Food deliveries can be purchased through different channels, including in-person orders, telephone orders, orders through restaurant and grocery chain websites, and orders placed through third-party intermediary websites and apps. The use of digital channels for placing food delivery orders has been steadily growing in Europe over the past decade, along with the development of mobile services, social media and data analytics (F&D Europe, 2019). The percentage of consumers purchasing food or groceries online in the EU-28 grew from 11% in 2007 to 24% in 2017 (Figure 3).

Figure 7. Percentage of online purchases of food or groceries by individuals in the EU-28 [Eurostat: isoc_ec_ibuy] (EC, 2018, p. 2)



² According to NACE division, restaurants and mobile food service activities (Group 56.1) include restaurants, cafeterias, fast-food restaurants, food delivery services (such as pizza), take-out eating places, ice cream van vendors, mobile food carts, food preparation in market stalls, restaurant and bar activities connected to transportation (for example, on boats or trains), when carried out separately from the provision of transport services.

Figure 8. Online shares food delivery industry



The growth of online grocery orders has been driven mostly by the grocery chains’ own websites and mobile services. However, the growth of digital restaurant food delivery orders has been driven by third-party apps or platforms, which have resulted in increased sales for the European restaurant sector (Table 5). In this study, we therefore focus on the platformization of restaurant food deliveries rather than groceries, although some of the statistics available to us also include online grocery orders.

Table 4. Impact of third-party food delivery platforms in selected European countries (Deloitte, 2019)

	Increase in the number of meals sold*	Increase in the year-on year revenue, % (profit)
London, UK	Total** 4%	£323M, 1.4% (£189M)
Paris, France	Chains 10%, independent 4%	€94M, 1.1% (€18M)
Warsaw, Poland	Total 1.5%	€24.4M, 1.0% (€10.2M)
Madrid, Spain	Total 2%	€23M, 0.3% (€36M)

*Including both chains and independent restaurants
 **Across sectors

By the platformization of food delivery, we thus refer to a transformation where restaurant delivery orders are increasingly placed through third-party intermediary websites and apps, which function as two-sided or even three-sided platforms. Two-sided food delivery platforms allow consumers to place orders with restaurants, presenting their menus and conveying orders in return for a fee (ibid.). Restaurants deliver the food through their own couriers or contractors. Examples of such two-sided food delivery platforms include Takeaway.com and Just Eat. These platforms are also called aggregators (ibid.). Three-sided food

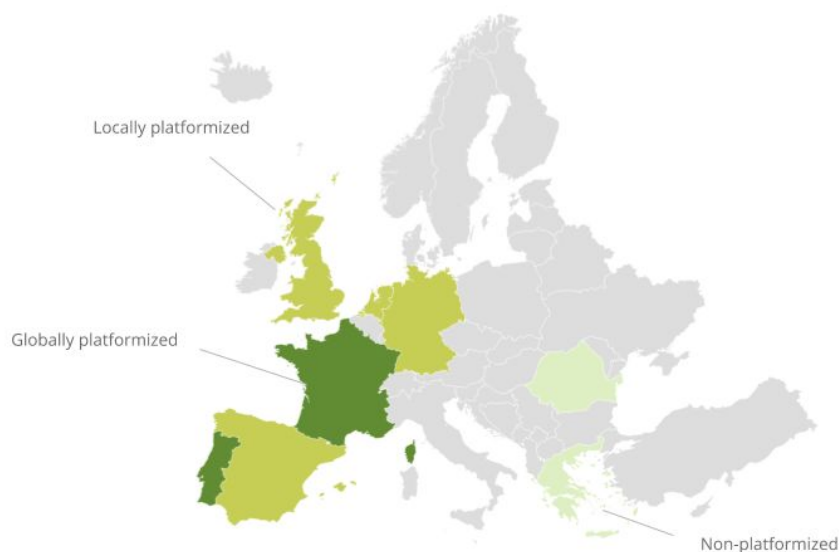
delivery platforms add a third set of participants to the equation: independent delivery workers. Restaurants pay a fee to access the consumers and also the delivery workers who deliver the order (ibid.). Examples of these platforms, which are also called gig platforms, include Uber Eats and Deliveroo.

One of the major food delivery platforms in Europe is Takeaway.com, founded in 2000 in the Netherlands. It is a two-sided platform where deliveries are conducted by the restaurants' own staff or contractors. Its gross revenue increased by 78% from €240M in 2018 to €427M in 2019 (Takeaway.com, 2020). Its revenue growth in the German market was 145%, and in the Netherlands 23%. The rapid growth reflects its 2019 acquisition of two competitors: Delivery Hero and Foodora. However, the company had difficulty seizing market share in the UK. As a result, it stopped its operations in 2016 and sold its customer portfolio to rival Just Eat in 2016 (De Vries, 2016). In 2020, Takeaway.com merged with Just Eat, and the companies are in the process of combining their operations (Takeaway.com).

A significant global competitor, U.S.-based Uber Eats, opened its London operation in 2016 (Turner, 2018). It is originally a three-sided platform where deliveries are carried out by restaurant-independent gig workers. However, in Europe it is also offering its platform as a two-sided version to restaurants that prefer to use their own delivery staff (Uber Eats, 2020). This way, it seeks the business of smaller, independent restaurants as it competes with Just Eat and Takeaway.com in a crowded market. Uber Eats is rolling out the two-sided version which simply connects customers to restaurants in 150 towns and cities in Belgium, France, Italy, Poland, Portugal and Spain (Prodhon, 2019).

We examined the platformization of the food delivery industry across selected European countries, focusing on both the degree of platformization (how much of the market is mediated by platforms) as well as the nature of platformization (are the leading platforms global or local). We found that the countries fell broadly speaking into three clusters, described below.

Figure 9. Food delivery industry platformization countries



Cluster 1: Countries with a globally platformized food delivery industry

Countries that are “globally platformized” are those in which the food delivery sector is moderately platformized by global platform companies, mainly Uber Eats. Countries falling into this category are France and Portugal.

In France, online delivery is not a popular method to get food from restaurants. The percentage of individuals who ordered food or groceries over the Internet for private use in 2017 was only 22%, which is below the average of EU-28 at 24% (EC, 2018, p. 3). Furthermore, for the ready-made meal delivery markets, the percentage of online delivery sales of the total delivery sales was 8% in France compared to 51% in the UK in 2017 (Luty, 2019). In this relatively less platformized food delivery market, Uber Eats is the leader which launched in 2015 in the country (Ewencyk, 2015). It had about 38 thousand average daily active users in 2018 (Ram, 2018). Other European companies such as Just Eat and Deliveroo are the next largest in France (Statista, 2020d).

Similarly in Portugal, The percentage of individuals who ordered food or groceries over the Internet for private use in 2017 was only 19%, lower than that of France at 22% (EC, 2018, p. 3). The usage share of Uber Eats, launched in 2017 (The Portugal News, 2017), amounts to an estimated 30% of the online food delivery segment in 2018. Glovo launched in 2017 and it is the largest European online food delivery platform in the country (Silva, 2020).

A common feature of the countries belonging to the “globally platformized” category include the limited market size, the absence of established local food delivery platforms and the preference to Uber Eats of small local restaurants which wanted to avoid the risk of operating their own couriers.

Cluster 2: Countries with a locally platformized food delivery industry

Countries that are “locally platformized” are those in which the food delivery sector is highly platformized, but mostly through local or European platforms such as Takeaway.com, Just Eat and Glovo. Countries falling into this category are the UK, Germany, the Netherlands and Spain.

The Netherlands had the highest percentage of individuals at 37% ordering food or groceries online as of 2017 (EC, 2018, p. 3). Thuisbezorgd.nl launched in 2000 in the Netherlands and changed its name to Takeaway.com in 2011. Takeaway.com has the most usage share of 70% in the country’s online food delivery segment followed by Uber Eats and Deliveroo in 2018 (Statista, 2020f). Since Takeaway.com actively acquired food delivery platform companies in different regions in Europe, it experienced scale benefits from the integration. Its gross revenue in the Netherlands increased from €98.29 million in 2018 to €120.71 million in 2019, which is 23% growth (Takeaway.com, 2020). This growth is expected to occur further after the recent merger with the most profitable food delivery platform company in the UK, Just Eat (Smith, 2019).

In the UK, 35% of individuals ordered food or groceries online in 2017 (EC, 2018, p. 3). The most popular takeaway delivery providers in the UK are Just Eat followed by Uber Eats and Deliveroo³. Just Eat accounts for 40% of the British online food delivery segment in 2018 (Statista, 2020g). The average daily active users were 500K for Just Eat, 51K for Uber Eats and 45K for Deliveroo in 2018 (Ram, 2018). Just Eat launched in

³ Based on the survey question asking which food delivery apps or websites people use the most often by GlobalWebIndex in November 2018. 1,640 of respondents are takeaway lovers in the UK aged 16-64.

2001 in Denmark and moved its headquarter to the UK in 2006 after seeing the success of its expansion (Di Lascio, 2017). In the UK, users spent the most ordering food from traditional restaurants or through Just Eat which amounts to over £4M compared to about £1.7M through Deliveroo and Uber Eats in 2018 (Ascher, 2019). Takeaway.com has been active on the British market since 2016 but it left the UK because it could not become the market leader in the country (RTL Z, 2020).

In Germany, 28% of individuals ordered food or groceries online in 2017 (EC, 2018, p. 3). Delivery Hero has been the most popular food delivery platform since it launched in 2011. Foodora was founded in 2014 and foodpanda was founded in 2012 but both were merged with Delivery Hero in 2015 and 2016 respectively (Delivery Hero, 2016). All German delivery platform companies were acquired by Takeaway.com in 2019 (Ksienzyk, 2019). Thereafter, Takeaway.com is the dominant market leader in Germany where its usage share was 65% in 2018 (Statista, 2020g). Deliveroo was following after Takeaway.com but it left the German market in 2015 (DW, 2019b). The gross revenue of Takeaway.com in Germany increased from €86.04 million in 2018 to €210.94 million in 2019, which is 145% growth.

Lastly, in Spain, Glovo is the most rapidly growing food delivery platform company founded in 2015 (Lewin, 2018). It takes 1M orders per month in the country for not only food but everything. Glovo brought chains such as McDonald's and KFC onto the app which led to its massive growth of which other competitors like Deliveroo were not willing to meet demands (ibid.). Even though only 16% of individuals ordered food or groceries online in 2017 (EC, 2018, p. 3), the online food delivery market in Spain grows with high speed. Just Eat is the second most popular online food delivery app in Spain (Statista, 2020i). On the other hand, the average daily active users of Uber Eats are less than 2K in 2018 (Ram, 2018).

The three countries in the “locally platformized” category commonly have large market sizes where local companies are dominating. The markets in these countries are highly consolidated by Takeaway.com, which gives little chance for new entrants as well as global companies such as Uber Eats. This contrasts to the retail industry's locally platformized category but similar to its globally platformized category.

Cluster 3: Countries with a non-platformized food delivery industry

Countries that are non-platformized are those in which the food delivery industry is not platformized to a significant degree. Greece and Romania belong to this category.

In Greece, only 9% of individuals ordered food or groceries online in 2017 (EC, 2018, p. 3). Delivery Hero accounts for 80% of user share in the online food delivery market in 2018 (Statista, 2020j). Uber Eats launched in 2017 in Athens (Butschek, 2017) but its market share is insignificant.

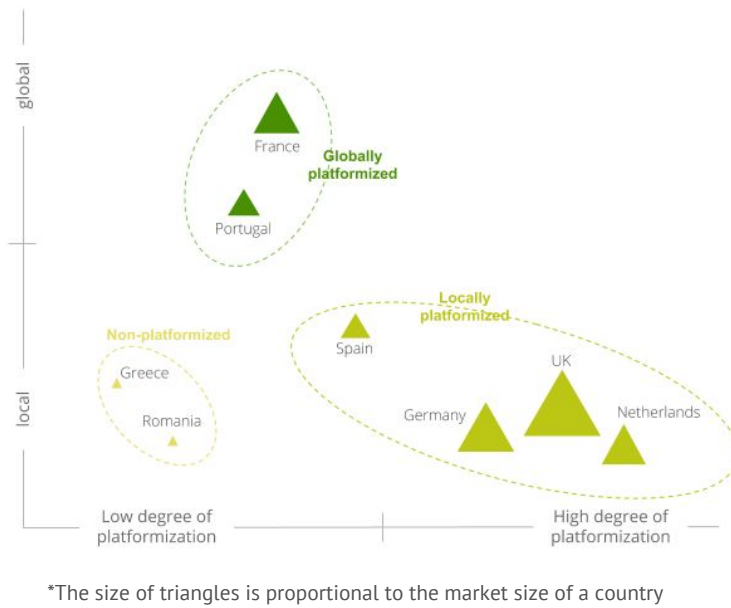
In Romania, only 5% of individuals ordered food or groceries online in 2017, which was the lowest among the EU-28 (EC, 2018, p. 3). Uber Eats launched in 2018 but it will close operations in Romania from June 2020 (Romania Insider, 2020).

The countries in the non-platformized category share characteristics such as low Internet penetration, small market size, and fairly early entry by European platforms, though with a subsequent failure to scale up.

Table 5. Food delivery platformization across selected European countries

Country cluster	Country	Uber Eats	Local/EU companies	Online food/groceries share	Reasons
Globally platformized	France	Launched in 2015	Just Eat (2011)	22%	Limited demand for food delivery
	Portugal	Launched in 2017	Glovo (2017)	19%	Limited market size. Uber Eats launched in Lisbon about one month after Glovo entered
Locally platformized	Netherlands	Launched in 2016	Takeaway.com (2000)	37%	Early growth and continuing consolidation by a large local platform company. High demand for food delivery
	UK	Launched in 2016	Just Eat (2006), Deliveroo (2013)	34%	Early growth and continuing consolidation by a large local platform company. Market share is split into several local companies. Largest online food delivery market in Europe
	Germany	Launched in 2017	Delivery Hero (2011) (Foodora 2014, Foodpanda 2012)	28%	Early growth of several local platform companies. Second largest online food delivery market in Europe
	Spain	Launched in 2015	Glovo (2015), Just Eat (2012)	16%, growing rapidly	Expansion of large EU companies followed by rapid growth of a local company
Non-platformized	Romania	Launched in 2015 but leaving in 2020	Delivery Hero, Takeaway.com (2018)	5%	Low internet penetration and demand for food delivery. Limited market size
	Greece	Launched in 2017	Delivery Hero, Just Eat	9%	

Figure 10. Food delivery industry clusters



7 EXPLAINING COUNTRY DIFFERENCES IN PLATFORMIZATION

In the sections above, we saw that the platformization of different industries varied significantly between countries. In this section, we assess which of the factors identified in the literature review might plausibly explain these variations. We examine separately what factors could explain country differences in the degree of platformization (RQ1) and the nature of platformization (RQ2). We are particularly interested in whether the same factors can explain country differences across several industries, or whether different factors appear important in different industries.

Differences in degree

Figure 11. Explaining country differences in the degree of platformization in selected industries



Overall, regulatory differences seem to provide a plausible explanation for country differences in the degree of platformization in the taxi industry, but not in others. In the taxi industry, regulations vary significantly across countries and even cities. Strict regulations can present an entry barrier to platform companies. They also increase operating costs since platforms have to comply with multiple different regulatory regimes simultaneously. Uber has been successful in shaping regulations in some cases, but not all (Uzunca et al. 2018). However, compared to the taxi industry, the retail and food delivery industries are generally less regulated, and regulations are uniform across the EU and diverging less across countries. Thus regulation does not provide a plausible explanation for differences in platformization across countries in these industries. Recently, though, the COVID-19 pandemic and the soaring demand for delivery services has led to calls for more protection to delivery workers. This could result in increased regulation and regulatory divergence between countries.

Differences in market size appear to provide a plausible explanation for differences in the degree of platformization across all three industries. Larger markets are more attractive to platform companies, since they face high initial investments, but small marginal costs, and have to reach a minimum efficient scale. For example, in the retail sector, Amazon launched its services initially only in some of Europe’s largest geographic markets, including the UK, Germany and France, and only more recently the Netherlands. As a result, larger markets tend to be more platformized, whereas smaller countries are likely to be less platformized.

Similarly, across all the selected industries, differences in technology adoption offer a further plausible explanation for why the degree of platformization varies between countries. Platform companies rely on the widespread availability of technological infrastructure such as Internet connectivity, mobile devices, and mobile Internet. Thus the degree of platformization is generally higher in countries in which these technologies have a higher penetration among consumers and firms. However, market size and technology

adoption are correlated in Europe, and in practice their effects are difficult to disentangle.

We also noted that differences in the strength and direction of network effects could explain differences in the degree of platformization between industries. In the taxi and food delivery markets, there are significant negative direct network effects for consumers, as more consumers means more congestion and longer waiting times. In the retail industry, congestion is possibly less pronounced. In a purely digital market, such as app stores, congestion would be negligible. The congestability of an industry could vary between countries and cities; for instance, restaurant delivery platforms could get congested more easily in locations where restaurants are smaller and less industrialized. However, in this study we did not identify any data that would address this issue, so this potential explanation for country differences in the degree of platformization remains to be studied.

Differences in nature

Figure 12. Explaining country differences in the nature of platformization in selected industries



Regulatory differences are also a plausible explanation for country differences in the nature of platformization in the taxi industry, but not so much in other industries. Local platform companies have in some countries enjoyed better relationships with regulators than Uber, which has tended to antagonize many European regulators. In less regulated jurisdictions Uber has had better success over local platform companies.

Differences in market size help to explain differences in the nature of platformization across all the selected industries. Larger markets are more likely to attract an early entry from a global platform company. This leaves smaller markets initially uncontested for local platform companies. Conversely, hyper-local platforms whose identity, business practices, and supply chains are very specific to their home locale may have difficulty scaling up to capture larger markets.

Differences in technology adoption do not seem to provide a plausible explanation for country differences in the nature of platformization. Both local platforms and global platforms will have an equally difficult

time entering markets that have not adopted the technologies that they rely on. Low technology adoption is of course likely to be associated with lower likelihood of local platform alternatives emerging in the first place, which we address separately as the strength of entrepreneurial ecosystems.

In markets where positive network effects are strong and negative network effects weak, first-mover advantage can result in market dominance that is difficult for competing platforms to challenge later. Thus countries where the first mover was a local platform are more likely to remain locally platformized, and those where the first mover was a global platform are more likely to remain globally platformized. Whether the first mover in a country is a local or a global platform is of course not entirely arbitrary. As discussed above, global platforms target larger markets first. And whether local platform companies emerge in the first place is likely to be associated with the strength of the country's start-up ecosystem and technology industry clusters. All things being the same, it is plausible that countries with a stronger start-up ecosystem and more existing technology firms are more likely to end up platformized by local platforms, although our data did not allow us to examine this issue in detail.

Differences in the strength of the entrepreneurial ecosystem appear to be some evidence for country differences in the nature of platformization in the retail industry, but less in taxi and food delivery industries. Once Amazon has entered a market, local platforms rarely manage to capture a significant market share, with the exception of Zalando. In food delivery, the market appears to remain open to local platform competitors at least until it has been consolidated by a major platform company like Takeaway.com or Just Eat. In the taxi industry, even a dominant market share has not protected Uber from regulatory changes that result in local platforms eating into its market share.

8 CONCLUSIONS

In many European industries, digital platform companies have become powerful intermediaries that sit between supply and demand. This has created benefits such as efficiencies and enlarged markets, but also concerns such as changing labour practices and monopolistic rent-seeking by some platforms.

However, this “platformization” of industries is not uniform between countries. We found that in some European countries, the retail, taxi, and food delivery industries were platformized to a much higher degree than in other countries, in terms of the share of the overall market that passes through platforms. We also found that the nature of the platforms varied between countries, with some countries being platformized mainly by large global platforms, while in other countries local platform companies were stronger.

These different platformization outcomes can have very different implications to consumers, workers, and incumbent firms, so it is important to understand why countries differ in these regards. We found that differences in market size and technology adoption were plausible explanations for why some geographic markets are platformized to a higher degree than others. This applied to all the three industries we examined: retail, taxi, and food delivery. In addition, regulatory differences provided a highly plausible explanation in the taxi industry, but not in retail or food delivery.

Furthermore, we found that differences in market size and the strength of the local entrepreneurial ecosystem could plausibly explain why some countries are chiefly platformized by large global platform companies and others by local platforms. This applied across all the three industries studied. Regulatory differences once again offered a plausible explanation in the taxi industry but not elsewhere.

These findings have various implications to policy and practice. Larger European markets are more likely to enjoy the benefits of a high degree of platformization, but also the concerns that come with having global platform companies dominate the market. Experiences from the taxi industry suggest that regulatory interventions can re-open a market for competition from local challenger platforms. But invasive regulation may not be palatable for new entrants in the retail industry, for instance.

From the point of view of promoting local platform innovation, technology adoption appears to be a double-edged sword. On the one hand, a high level of technology adoption among firms and consumers is necessary for local platform companies to have the infrastructure necessary to launch their business, and thus policy makers should continue to promote Internet and mobile adoption in Europe's less-connected regions. On the other hand, Internet and mobile penetration also open up the market for global platforms, which may seize the first-mover advantage if local firms are not ready. Especially in the retail industry, a first-moving global platform appears difficult to challenge once it has established itself. Investments into technology adoption should therefore go hand-in-hand with investments into local digital entrepreneurship to ensure that local platforms are ready to seize the initiative.

Our study comes with several limitations. The data is collected from various secondary sources whose methods and concepts are not always compatible. The analyses involve a significant degree of subjective judgment, particularly concerning the plausibility of different explanations for the observed country differences. The industry selection is limited and lacks variation in some key dimensions; in particular, it would be useful to include an industry whose products can be digitally distributed, and an industry that remains non-platformized across the continent, for contrast.

We also focused on a very particular conception of platform and platformization in this study. Namely, we focused on transaction platforms that facilitate transactions between buyers and sellers, and conceptualized industries as flat markets where the platforms enter as intermediaries between supply and demand. In the retail and taxi industries, this conceptualization of platformization arguably captures the main contours of the phenomenon. But in the food and beverages industry, digital platforms have influenced the industry not only in terms of food delivery, but in other ways as well, at different points of the value chain, including for instance restaurant review and booking platforms' influence on restaurant selection. For the sake of simplicity, we focused only on the delivery part of this industry. Finally, in some industries, the distinction between platform companies and incumbent firms is blurring, or was not crystal-clear to begin with. In the taxi industry, in many cities it was commonplace for taxi firms to use self-employed drivers even before platforms. In recent years incumbent taxi firms have also adopted apps not dissimilar from Uber's service. Thus in some cases incumbent firms should start to be seen as local platforms rather than as non-platformized firms. However, this would require more detailed data than what current sources provide.

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