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Additional Information

The collaborative economy and taxi services: moving towards new business models in Spain

Abstract

The collaborative economy brings new business models through digital platforms which compete with services that have traditionally been highly regulated. This is the case of the taxi sector. The new business models that have emerged in private passenger transport are mainly based on the customisation opportunities provided by big data, yet the traditional business model followed by the taxi sector is finding it difficult to adapt to these changes in order to remain competitive, as we can observe from a content analysis of news over the last year in Spain. In this paper, we analyse the need to raise these issues through a governance model in which all stakeholders can express their opinions, trying to achieve solutions based on consensus for real deregulation. In order to achieve this consensus, government will need to play a crucial role, despite the fact that it has recently transferred decision-making to regional and local governments.

Keywords: *collaborative economy, passenger transport, business model, stakeholders, regulation, government.*

Introduction

According to the European Commission (2016: 3), the collaborative economy is based on “business models where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals. The collaborative economy involves three categories of actors: (i) service providers who share assets, resources, time and/or skills — these can be private individuals offering services on an occasional basis (‘peers’) or service providers acting in their professional capacity (“professional services providers”); (ii) users of these; and (iii) intermediaries that connect — via an online platform — providers with users and that facilitate transactions between them (‘collaborative platforms’). Collaborative economy

transactions generally do not involve a change of ownership and can be carried out for profit or not-for-profit”.

Despite this extensive description, the concept has not received unanimous acceptance in academia. In fact, Gyimóthy and Dredge (2017) identified eighteen different terms related to the collaborative economy, which are used interchangeably. Depending on the different actors, and especially on the interests involved, the approaches to the collaborative economy vary (Gruszka, 2017). From a broader perspective, the collaborative economy is understood as a wide range of digital platforms and offline activities centred on the concept of sharing, which includes the activities of financially successful companies, like Airbnb, to smaller initiatives such as makerspaces (Schor, 2014). Conversely, from a narrower perspective, these sharing activities should not imply monetary compensations (Belk, 2014). Some services are considered as ‘collaborative economy’ services and some are not, depending on the author and different court rulings. Moreover, the ‘sharing economy’ concept, in the sense of non-profit (Gössling and Hall, 2019), would be difficult to apply as a synonym of some of these services. Following Grasl’s matrix (2012), the reality is that these kinds of services fall somewhere between public-private property (or service), and having an economic-social objective.

The collaborative economy can have a capitalist aim or an altruistic objective (Fresneda, 2018). According to different authors, the role of the different parties in this new environment is unclear and labour rights and trust will need to be reinforced based on an innovative approach.

Within the collaborative economy, the transport sector, and public transport in particular, has been subject to different interpretations, regulations, and, on many occasions, conflict derived from this digital on-demand economy. Some passenger transport services, such as Uber and Cabify, have been received differently depending on the European country and even in different regions of the same country, as is the case in Spain, where the public passenger transport provided by taxis is clashing with those of collaborative economy platforms like Uber and Cabify.

Moreover, governments are disorientated and face the dilemma of whether to create jobs or maintain current labour rights, since the majority of the people who work for these services are self-employed (Muñoz, 2018). In addition, the Court of Justice of the European Union, in its ruling of 20 December 2017 (CJEU, 2017) found that Uber is not an intermediation

or a free delivery service. It therefore upheld the claim of the Asociación Profesional Elite Taxi that prevents anyone without a specific licence, such as Uber, from operating. For this reason, in Spain this kind of companies can only operate through drivers with specific licences, known as VTCs (private-hire driver licences). These kinds of licences for luxury intraurban transport have been operating since the arrival of collaborative platforms.

As far as we can see, the collaborative economy reformulates some traditional business models by reinventing and replanning their services (Table 1). We can observe that they are based on a two-sided model (Täuscherand and Kietzmann, 2017) where a platform connects users with drivers. For example, Blablacar is a business model which, in theory, aims to share private transportation yet, at the same time, it is increasingly becoming a service which is similar to a private-hire driver and vehicle licence (Muñoz, 2018), but with fewer legal requirements.

Table 1. Positioning matrix of business models for private transport services

	With driver	Without driver
With licence	Taxis (MyTaxi, PideTaxi) VTC* (Uber, Cabify, Lyft)	Rent a car (AVIS, Europcar, Hertz, Sixt)
Without licence	Blablacar, Rideshare4Less, GoCarma	Drivy (also with driver), Socialcar, Amovens

Source: compiled by authors.

** VTC (private-hire driver licence)*

In the following sections, we focus on the passenger transport sector in Spain in order to reflect on the current business model used by taxis and VTCs, the existing conflicts and how the sector could become more cooperative. The taxi sector in Spain has opposed sharing the passenger transport market in the same conditions as VTCs, which has caused conflict that has still not been resolved. Other countries have already implemented measures aimed at solving the conflict between taxis and VTCs, trying not to harm either party. In Canada, for example, ride-sharing companies have been legalised and they pay an annual fee to the city council to operate their services, as well as six cents per ride to

finance the costs of implementing the regulation. Meanwhile, Australia has introduced reforms aimed at simplifying and modernising the regulatory burden surrounding the taxi industry (Chassin and Msaid, 2016):

- Eliminating the privileged status of existing taxi dispatch companies, making them compete directly with applications like Uber, under the same legal status as Transport Booking Services.
- Eliminating all of the administrative costs related to operating a traditional taxi.
- Owners of taxi licences will receive compensation for their financial losses stemming from the regulatory change. These compensations will be financed in their entirety by a temporary \$1-per-ride tax, applicable both to traditional taxis and to services like Uber.

Some literature has pointed out the need to analyse how deregulation affects different stakeholder groups in order to engage them (Jansson, 2010; White, 2019), yet there is no research on this issue in the recent case of the Spanish taxi sector. Moreover, there is a gap in the literature about how collaborative economy business models work (in this case, private transport services) and whether they can “align incentives with key stakeholders to ensure longevity of their operations” (Cohen and Kietzmann, 2014:294; Täuscherand and Kietzmann, 2017).

Based on these gaps in governance within the sector, four research questions are posited in the paper:

RQ1: what is the collaborative economy? Are VTC platforms part of the collaborative economy?

RQ2: who are the stakeholders involved?

RQ3: why is there conflict between the taxi sector and some VTC companies?

RQ4: how are these business models evolving?

Background: the collaborative economy and private transport services

The sharing or collaborative economy is possible thanks to the Internet, social networking, smartphone solutions, geolocalisation and big data technologies (Standing et al., 2018). However, for our purpose, we prefer to use the term “collaborative economy” in the sense of the neoliberal method of offering services (Gössling and Hall, 2019), i.e., based on a profit commitment. Doménech (2015: 66), highlights that,

“the principal reason for the appearance of the collaborative economy is the spectacular progress of the information technologies which has allowed to cheapen exponentially some activities such as obtaining, storing, processing and communicating the information that the users perform to collaborate in the production and consumption of goods and services, interchanging or sharing them”.

In terms of passenger transport services with a driver, we can see that current business models, such as Uber, Cabify, MyTaxi and PideTaxi, involve the three agents mentioned by the European Commission (2016: 3), that is: drivers, users and an intermediate online platform.

On many occasions, “multiple agents, including public and private providers, seek to develop business models which address deficiencies in public infrastructure (e.g., streets, parking) and public transit systems, historically the exclusive purview of local and regional governments” (Cohen and Kietzmann, 2014:280).

Täuscherand and Kietzmann (2017) suggest that it is important to focus on one’s competitors in the collaborative economy. Though it is important to have a critical mass through scalability and networking, it is more essential to ensure optimum performance (Täuscherand and Kietzmann, 2017). Standing et al. (2018) focused on the facilitators and barriers for collaborative transport. The facilitators included trust, technology platforms and the trend towards non-ownership of assets. However, the potential barriers are over-regulation, inconsistent quality of service and the need for recommendation.

According to Andersson et al. (2013), VTC platforms come under peer-to-peer service sharing. Although it is intangible, there is a requirement to meet at a time and a place, and it is an intermediate service because “every service sharing instance is unique and requires the platform to arrange a new instance” (p. 10). Cohen and Kietzmann (2014:281) explained that “the private sector has developed business models to address a failure in the mobility market place..., due to the increased congestion in cities, the lack of sufficient access to quality transit alternatives and the lack of affordable private and clean vehicles for consumers”. In addition, these new platforms have prospered because their costs are low, in the sense that there are no employees and no need to maintain resources (Adler et al., 2015; Täuscherand and Kietzmann, 2017).

However, Cohen and Kietzmann (2014) warned about the problems that arise when there is no agreement with local governments. “P2P rideshare companies have primarily avoided collaborations with cities and public transit agencies to support service integration or enhancement” (p. 288). These problems include the challenging issue of drivers’ labour rights. “Uber’s position as a technology company that offers software to connect passengers with drivers implies that any emergent (and negative) effects of its system are a natural feature of connectivity rather than an enforced hierarchy or employment power structure” (Rosenblat and Stark, 2016:3764). Some court rulings are starting to consider drivers to be employees of these platforms (Adler et al, 2015), as opposed to self-employed individuals.

However, there are still doubts as to whether these kinds of ridesharing platforms can be included in the collaborative economy given that a passenger normally travels alone.

According to International Financial Analysts (AFI 2017), in Spain, liberalisation would produce the following effects, to name but a few:

- Regarding users, the weighted average fare for taxi and VTC services would drop by 35% in the cities of Madrid and Barcelona. Thus, the consumer surplus would increase by more than €3 per journey and user.
- Partial abandonment of the use of private vehicles would cause (solely in Madrid) GVA (gross value added) to rise by €263 million, 7,163 direct jobs as drivers to be created and related tax collection of €109 million.

How all the stakeholders involved are dealing with this new scenario (Jansson, 2010; White, 2019), how they will do so in the future, and the search for suitable governance models (Cohen and Kietzmann, 2014; Täuscherand and Kietzmann, 2017) are the main objectives of this study, which focuses on the case of Spain.

Method

To answer our research questions, firstly, we analysed the specific case of the taxi sector in Spain by means of qualitative data analysis, with a mixed inductive and deductive content focus (Berg and Lune, 2012). We followed the process for content analysis proposed by Elo and Kyngä (2008), who suggested the three steps of preparation, organisation and reporting. According to these authors, inductive content analysis is used in cases where

there are no previous studies dealing with the phenomenon or when it is fragmented, while a deductive approach is useful if the general aim is to test a previous theory in a different situation, from the general to the specific. In our case, we wanted to compare how the different stakeholders (our categories) (Figure 1) were dealing with the issues related to the conflict (Jansson, 2010; White, 2019).

Preparation. During 2018-2019, and after the European Court ruling, all Spanish newspapers provided coverage of the taxi-VTC issue. Through data analysis, we immersed ourselves in the data and allowed themes related to the conflict to emerge (Hsieh and Shannon, 2005). We performed a content analysis taking different articles published in the Spanish newspaper, *El Mundo*, as the units of analysis to obtain a coherent, linear sequence of the conflict and to identify all the concerns of the different stakeholders. These selection criteria gave validity, reliability and objectivity to the analysis (Zhang and Wildemuth, 2017). Using the words “taxi” and “VTC” and limiting the period from 1/1/2018 until 31/1/2019 in *elmundo.es*, we found 283 news items related to the topic.

Organisation. According to different authors (Doménech, 2015; Standing et al., 2018; Täuscherand and Kietzmann, 2017; Rosenblat and Stark, 2016), there are negative impacts of the new passenger transport scenario (system and economic failures, barriers, lack of government coordination) that affect different stakeholders. Accordingly, we decided to analyse the impacts shown in Figure 1, adding violence as a result of the events surrounding the recent conflict in Spain.

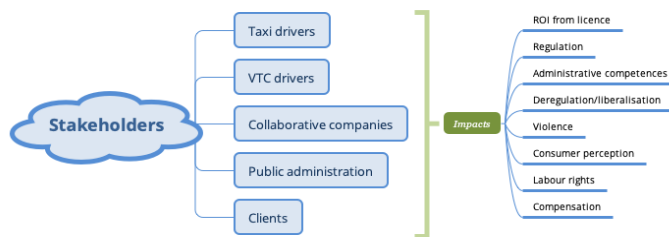


Fig. 1 Stakeholders' categories and code themes.

Source: compiled by authors.

Reporting. The findings of our analysis are included in parts one and two of the Results section (The conflict and The stakeholders), using descriptive language to present the sequence during the conflict and the negative impacts on the different stakeholders.

In a second stage, we analysed current business models using the Canvas model, based on Osterwalder and Pigneur (2010). Through the Canvas they created a shared language that explains in an easy, visual way “how a company creates, delivers and captures value”. This model has also been used to analyse other sharing mobility services (Gilibert and Ribas, 2019). The capability of the Canvas to illustrate a business model and the interconnections between its elements on a piece of paper has extended its use by both practitioners and researchers (Joyce and Paquin, 2016; Urban et al., 2018). The Canvas makes it easy to present and compare business models used in different companies. Other models, however, are more focused on analysing whether a business model functions correctly through its activity system and the virtuous cycles (Casadesus-Masanell and Ricart, 2011). However, the Canvas gives a more comprehensive, simpler explanation of a business model. The advantages found in the Canvas are the reasons why we chose it to represent the three models examined in this section. Four websites were explored to obtain information about the value proposition offered to passengers and drivers by specific apps and platforms. These websites belong to FREE NOW, PideTaxi, Cabify and Uber.

Results

The conflict

In the particular case of transport, and following the recent European Court ruling, some court decisions in Spain have had negative repercussions for companies such as Cabify and Uber, as they have deemed that these services should be judged as transport services and not as intermediate services (Marraco, 2018). In these cases, Spanish legislation requires drivers to have a special licence to operate (VTC), according to article 42.1, Law 16/1987, July 30, on Inland Transport (last updated 2018).

Other platforms such as BlablaCar try to get around the law using other types of business models (Muñoz, 2018), whilst in other countries, such as the USA, California has approved the circulation of autonomous cars controlled remotely, even though the tests carried out by Uber have not always been successful (Iglesias, 2018).

The reality is that, despite the different legal decisions, collaborative economy companies are taking the reins of the future of the sector. In April, Cabify organised a workshop in which other firms participated, such as Uber, Car2Go, Emov, Ecooltra, Ofo, and so on. However, taxi platforms such as Fedetaxi and MyTaxi refused the invitation (Martínez, 2018a).

In Spain, the authorisation of taxi licences falls to local government while VTC licences are given by the Ministry of Development. However, recent regulations have decided to transfer the granting of VTC licences to regional governments (Munera, 2018) and local councils (El Mundo, 2018) within a period of 3-5 years, that is around 2022 (Martínez, 2018e).

The present controversy centres on what is known as the 1/30 ratio. This means that one VTC licence can be authorised for every 30 taxi licences. According to the taxi sector, these ratios have been exceeded. This has occurred largely because the region of Madrid among other regions, envisaged authorising 300 pending VTC licences dating back to the period between 2009 and 2015 (Fernández, 2017). The reason was that the sector was liberalised in 2009 (Ómnibus Law 25/2009) and the Government eliminated these ratios. However, pressure from the taxi sector pushed the Government to reintroduce it in Article 181.3 of the Bylaw of the Inland Transport Law of 1990 (updated by Royal Decree 1057/2015, 20 November). Moreover, in November 2017, the Supreme Court accepted 80 VTC licences that had also been refused by the region of Madrid in 2014. Conversely, other regions did not accept these pending licences.

This reformulation of the regulation by the Ministry of Development moved the National Commission on Markets and Competition (CNMC) to appeal to the Supreme Court in order to remove the ratios and the limitation to operate between regions (Gutiérrez, 2018; Martínez, 2018c). Thus, we have two groups: one, led by the CNMC, which is against the ratio and the limitation between regions, and is also represented by Unauto, Uber and Maxi Mobility Spain (Cabify), and the second, led by the Ministry of Development which supports maintaining the ratio, and gives assistance to the different parties involved: the State Council, the Madrid City Council, the Madrid Regional Government, the Catalonia Regional Government, Fedetaxi, Elite Taxi, the Autotaxi Madrid Association, the

Professional Taxi Federation of Madrid, the Taxi Trade Union of Catalonia and the Spanish Association of the Digital Economy.

According to the CNMC, in recent years, taxi licences have increased by 2% and, in any case, the 1/30 ratio is not in line with the reality of demand. Moreover, current firms in the market think that the entrance of new operators is being blocked which could lead to an oligopoly. On the other hand, the Ministry of Development points out that regional governments and local councils can reduce the ratio if they want and the national one is a limit to give security to licence legislation (Martínez and Marraco, 2018a). For example, in the city of Barcelona the local government has decided to add an extra licence that seems to reduce the national ratio even further (Urrutia, 2018). This new licence has been stopped in court (Oms, 2018).

Other limitations of the VTC licence regulation that need to be solved are (Martínez and Marraco, 2018b) the need to have seven medium-high standard cars which need to be 4.6 metres long and have 12 tax horsepower, the need to previously book the service, and to give 80% of the service in the same region where the licence has been obtained. The taxi sector wishes to add a minimum kilometre requirement for VTCs (Núñez-Villaveirán y Durán, 2019) and they have taken some VTCs to court for unfair competition (EFE, 2019a).

As far as we can observe from the news content analysis, there have been meetings with government but these have not been able to bring all the parties together (Sampedro, 2018). Sadly, some taxi drivers have used violence against VTC drivers (Negre, 2018) and have organised frequent strikes (El Mundo, 2018; Oms, 2018; Martínez, 2019a) which has affected their image in society.

The main problem is that it is difficult to maintain the current situation because all the pending licences from 2009 to 2015 need to be approved by the courts and, if they are revoked, then the Government will have to pay compensation (Martínez and Urrutia, 2018a). On the other hand, it is not clear whether this compensation will be paid by the Central Government or regional ones (Martínez and Viaña, 2018). This is the core of the conflict between the Ministry and the CNMC, but also between the two main trade unions in Spain. While CCOO (Comisiones Obreras) defends the taxi drivers, UGT (Unión General de Trabajadores) defends the VTC drivers who could lose their licences (Martínez, 2018d).

The point is that a definitive solution does not seem possible and, with the latest changes in regulations (especially Royal Decree-Law 13/2018, Spanish Official State Gazette, 2018), both type of services are currently operating in an uncertain environment (Martínez, 2018f; Martínez and Urrutia, 2018b). In around four years' time, when the Royal Decree-Law comes into force, regional governments will be able to regulate VTC licences in different locations and local councils will be able to do so within their municipality (El Mundo, 2019). In fact, some regional and local governments have already regulated VTC operations, such as the Valencian Region (Generalitat Valenciana, 2019).

As a result of this analysis, Table 1 shows a chronology of the conflict:

Table 1: Chronology of the conflict

Year	Events
1987	Law 16/1987, 30 July, on Inland Transport (regulation 1/30 ratio)
2009	Ómnibus Law 25/2009, liberalisation, ratio removed
2012	Entrance of collaborative economy companies in Spain
2015	Some new licences stopped, Royal Decree 1057/2015, ratio 1/30
2017	Supreme Court of Spain: restrictions lifted on the 2009-2015 backlog
2017	Sentence of the European Court, transport regulation
2018	Amended Inland Transport Law, September 30, ratio 1/30 (article 48.3)
2018-2019	Strikes in Madrid and Barcelona (taxi)
2018-2022/2024	Transferring licences and ratios to regional and some local governments
2019	Jobs lost (VTC)
2022/2024	Problem to apply ratios and possible compensation

Source: compiled by authors

The stakeholders

We observe that the role of government is crucial in this case because there is a need to tackle and resolve a series of challenges concerning different stakeholders (Figure 1):

- Disputes over VTC licences: the number of these licences has changed over the years. Some applications have been blocked but some court rulings have confirmed their approval (Fernández, 2017).
- Different business models to the traditional taxi model, such as Uber and Cabify (Otero, 2017).
- Diverse interpretations about how to liberalise the sector (Domínguez del Valle, 2017 and Herce, 2017).
- New user demands (Esteve, 2016), especially among young people.
- The regulation of the taxi service in Spain is based on expensive licences, compared to cheaper VTC licences. There have been other problems such as transfers and some owners accumulating some licences, different taxi associations, and so on. However, a positive step has been the creation of a shared app (MyTaxi, 2016) and the sector's own app: PideTaxi.
- Some taxi drivers also hold a VTC licence. Some apps could integrate both services (Martínez, 2019b).
- In Barcelona, some VTC companies have already announced redundancies which also has consequences for the tax system (Fernández, 2019a).

Different stakeholders have different points of view. Users-clients value some features of this kind of platforms using VTC drivers, such as easy to use apps, clean and big cars, and lower prices, on the whole. However, they point to problems such as excessive waiting times, the lack of car stops and the smaller number of cars available because there are fewer VTC licences than taxi licences (Esteve, 2016).

Taxi drivers' main complaint is that the VTC licences are cheaper than taxi licences and, in some cities and regions, the VTC/taxi ratio is not complied with, therefore leading to excess supply (Domínguez, 2017). They do not complain about the VTC companies operating legally but they do not agree with the international firms that do not contract their drivers directly.

On the other hand, VTC companies want to open up a niche in a market which is difficult to access even if the sector is liberalised (Herce, 2017). Moreover, these firms' business models are based on having a critical mass of drivers to guarantee immediate availability. Without this, these firms will find it difficult to survive (Andersson et al., 2013).

Given the conflicting interests of this phenomenon, the role of government is not an easy one. Both multinationals such as Uber and Cabify and the taxi sector are big, powerful lobbies in Spain. Current regulations are still very protective towards taxi drivers but this favouritism will be difficult to sustain in the future. It is a complex challenge that needs a systemic approach and the participation of all the stakeholders in order to find solutions. For Standing et al. (2018), the future will require government departments to work cooperatively.

Table 2 shows how each stakeholder group is negatively affected by the situation. After this analysis, we can observe how VTC drivers are the most negatively affected by the conflict. Above all, they face different service restrictions due to pressure from the taxi sector in the main cities (E.A., 2019).

Por otro lado, las empresas de VTC quieren abrirse un nicho en un mercado de difícil acceso aunque el sector esté liberalizado (Herce, 2017). Además, los modelos de negocio de estas empresas se basan en tener una masa crítica de impulsores para garantizar la disponibilidad inmediata. Sin esto, estas empresas tendrán dificultades para sobrevivir (Andersson et al., 2013).

Dados los intereses en conflicto de este fenómeno, el papel del gobierno no es fácil. Tanto las multinacionales como Uber y Cabify como el sector del taxi son grandes y poderosos lobbies en España. Las regulaciones actuales siguen siendo muy protectoras para los taxistas, pero este favoritismo será difícil de mantener en el futuro. Es un desafío complejo que necesita un enfoque sistémico y la participación de todos los actores para encontrar soluciones. Para Standing et al. (2018), el futuro requerirá que los departamentos gubernamentales trabajen de manera cooperativa.

Table 2: How the conflict negatively affects each stakeholder group

Stakeholders vs. problems	Taxi sector	VTC drivers	Companies	Government	Clients
---------------------------	-------------	-------------	-----------	------------	---------

ROI from licence	X				
Regulation (ratio, zones...)		X	X		X
Administrative competences		X	X	X	
Liberalisation of the sector	X				
Violence		X			X
Consumer perception	X		X		
Labour rights		X			
Compensation				X	

Source: compiled by authors

Sadly, the taxi sector is gaining a negative image from consumers, due to strikes and violence. Conversely, some VTC companies are seen as the capitalist part of the conflict and as not behaving ethically regarding drivers' labour rights (Täuscherand and Kietzmann, 2017). Finally, government has not provided a homogeneous framework for all the stakeholders concerned, generating considerable uncertainty and ambiguity. As Rosenblat and Stark (2016) highlighted,

“Uber’s claims regarding its labor model, which center on freedom, flexibility, and entrepreneurship, are complicated and contradicted by the experience of its drivers... power and information asymmetries emerge via Uber’s software-based platform through algorithmic labor logistics shaping driver behavior, electronic surveillance, and policies for performance targets” (p. 3777).

The situation is often different even within these companies. For example, some Cabify drivers are company employees because the firm acquired some VTC licences, whilst Uber has no direct employees. Similar situations occur in France, Italy, Belgium and Germany (Fernández, 2019b), as well as outside Europe, where there are similar conflicts in the USA (New York) (EFE, 2019b).

Business models

In order to analyse the main conflicting business models in this market, we examined three different models (Figures 2 to 4): taxi drivers (freelance), two-sided taxi organisations (MyTaxi, Cooperatives...) and collaborative economy companies (in Spain, based on VTCs: Cabify, Uber, etc.). To do so, we used the Business Model Canvas created by Osterwalder and Pigneur (2010). As Figures 2 to 4 show, a Canvas has nine building

blocks organised into three segments: creation, delivery and capture of value (Chesbrough and Rosenbloom, 2002; Teece, 2018), according to literature on business models. The blocks in the *creation segment* involve resources, activities and partners. Resources include cars, taxi-drivers and platforms, while activities are those required to manage a platform. Partners comprise, for example, companies which provide the technology needed to operate the platform. The blocks in the *value delivered segment* include customer segments, value proposition, channels and customer relationships. They refer to customers to whom firms offer their mobility services, the transport services offered, the channels used to sell these services, and how companies acquire and retain customers. The two blocks in the *value capture segment* are cost structure and the revenue model, which assure model profitability (Clauss, 2017). Explanations about each block for the three models analysed in this paper are included in the following paragraphs of this section, linked to Figures 2 to 4.

It is important to mention that the taxi sector is highly fragmented. According to data from the Ministry of Development, in June 2019, there were 62,787 taxi licences in Spain as opposed to 14,606 VTC licences. Madrid handles 25% of the total number of taxi licences in Spain (15,615) and 52% of the total number of VTC licences (7,662). The second most important city is Barcelona, with 11,271 taxi licences, while Valencia has 3,063 (Ministry of Development, 2019). In terms of VTC licences, Barcelona has 1,967 and Malaga has 1,479 (13% and 10% of the total). Therefore, fragmentation is particularly visible in large cities, where the number of licences is higher. However, fragmentation is particularly prevalent in the taxi sector, with 84% of owners only having one licence, whilst VTC licences are controlled by just a few companies. For example, three companies –Auro, Moove and Vector Ronda– own around 70% of the VTC licences (Negre, 2018b). The number of licences and greater fragmentation might explain why platform business models have broken into the market in large cities.

As the taxi market is highly fragmented, it is difficult to obtain market share on an individual basis. As a result, the incumbent drivers have tended to join associations which organise the supply and demand of taxi services through call centres. More recently, some associations and companies have developed applications (such as PideTaxi and NTaxi) that have increased the value delivered to both drivers and passengers, as they are capable of

seeking available vehicles for passengers who need transport (Apte and Davis, 2019). The development of these taxi apps was the reaction of Spanish taxi drivers to the irruption of large-scale mobility companies onto the market such as MyTaxi (FREE NOW after its merger), Uber and Cabify. As this paper was being written, taxi associations revealed that they were developing a joint platform to bring together all the taxi apps developed by Spanish taxi associations. However, competitors are advancing in their MaaS (Mobility as a Service) strategy.

According to Utriainen and Pöllänen (2018), MaaS “could be defined as a concept in which individual’s mobility needs can be fulfilled effectively and more sustainably than currently by integrating different transport modes and services” among which the “popularity of private cars is expected to reduce as flexible choices such as car-sharing and on-demand ride-sharing services become more common”. For example, the joint venture between the BMW Group and Daimler AG has created a multimodal mobility platform called REACH NOW, which will integrate the different mobility services, including FREE NOW. MaaS platforms put customers’ transport needs at the centre of their service, giving users information (including prices) about all the available options for moving from A to B, such as taxi, car-sharing and bike-sharing services (Surakka et al., 2018). In addition to transport services, they include payment and ticketing on the same platform (Utriainen and Pöllänen, 2018). This implies an advance to a Level 2 in MaaS or higher, according to the levels defined by Sochor et al. (2018).

The question is how can taxi apps belonging to Spanish taxi associations compete with MaaS (Mobility as a Service) platforms such as FREE NOW, Uber and Cabify?

To answer this question, it is important to understand that the strategies implemented by these platforms dovetail with two important aims. The first is that their business model has to generate positive network effects. This means that they need to attract users on both sides (passengers and drivers) of the equation to increase value and utility (Cusumano et al., 2019). The second is that these companies are start-ups (or act as if they were) in their upscaling phase, so they need high growth revenue even if this results in significant losses (Love, 2016). The three platforms analysed in this paper are FREE NOW, which works with taxis, and Uber and Cabify, which work with VTCs.

FREE NOW is the transport solution offered by YOUR NOW, the joint venture of Daimler AG and BMW Group. The two vehicle manufacturers joined forces to offer mobility

solutions, including taxi services. In Spain, FREE NOW offers taxi services in seven cities, including Madrid, Barcelona, Valencia, Seville and Malaga. In June 2019, the company announced that in 2018 it had reached the figure of 10,000 active drivers in Spain. Considering the cities where they operate and assuming that each driver has a licence, the firm works with 28% of taxi licences in these cities.

Uber, the American company, operates in four cities in Spain (Madrid, Seville, Malaga and Granada). They decided to leave Barcelona and Valencia after local governments increased the restrictions on VTC operations in the two cities in their attempt to support the taxi sector. The platform's customers include owners of VTCs, including those companies that have a significant share of licences.

Cabify is a Spanish company that operates in Spain and Latin America. In Spain, they offer services in nine cities (Madrid, Barcelona, Valencia, Seville, Malaga, Santander, Murcia, Corunna and Alicante). Contrary to Uber, they decided to continue operating in Barcelona and Valencia. The platform's customers also include the companies which concentrate an important share of VTC licences. However, Cabify has also acquired licences and companies to reduce its dependency on these firms. In June 2019, Cabify also offered its platform to taxis.



Fig. 2 Taxi drivers' business model.

Source: compiled by authors.

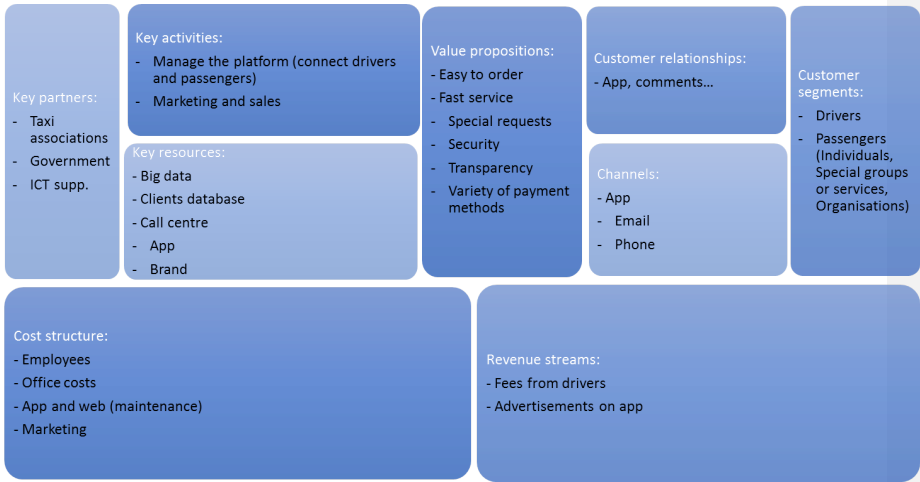


Fig. 3 Two-sided taxi organisations' business model (FREE NOW and Pidetaxi).

Source: compiled by authors.

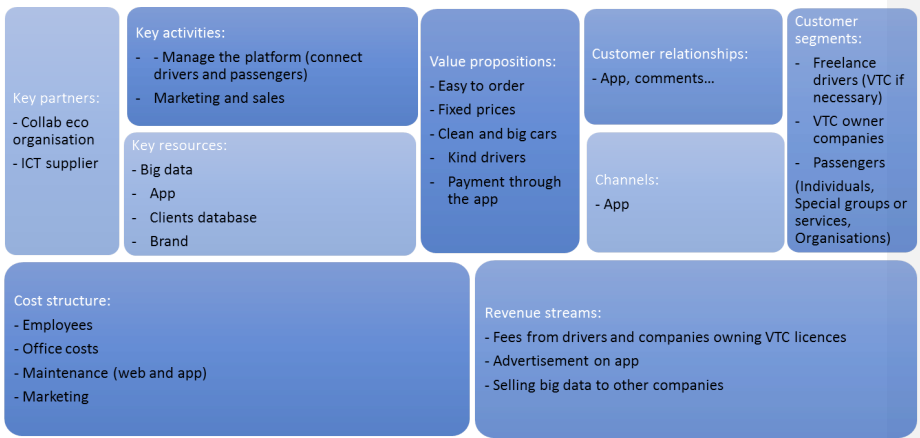


Fig. 4 Collaborative economy business model (VTC: Cabify and Uber).

Source: compiled by authors.

Segment 1. Delivery value

This segment includes three blocks of the Canvas model: customer segments, the value proposition delivered to them and the customer relationship.

The *customer segments* for taxi drivers are users to whom they and other companies offer transport services. The majority of operators compete for the same customer segments, which include individuals, businesses, hotels and other organisations which need a fast transport service within a city. Traditionally, customers were segmented according to their business and non-business profile. The business segment is of great interest to taxi drivers because demand is said to be less price-sensitive (Anwar, 2018). Hospitality is also included in the value proposition put forward by some companies as hotels and restaurants demand transport services for their own customers.

In the taxi drivers' business model (Figure 2), drivers establish a connection directly with the user and deliver the transport service. Rules allow users to take a taxi on the street (Cohen, 2018), which seems important in cities like Madrid (Vectio, 2017). Some incumbent companies connect drivers and passengers through a call centre but this solution became less popular when internet-based platforms arrived in Spain. They maintain call centres for users that are less familiar with technologies. The PideTaxi (18,000 drivers) and NTaxi applications are among the apps offered by taxi associations in Spain.

Osterwalder and Pigneur (2010) define the customer segments block as the "groups of people or organizations an enterprise aims to reach and serve". When the platform business model is considered (Figures 3 and 4), owners of platforms aim to reach and serve the two sides of the platform (Täuscher & Kietzmann, 2017; Kumar et al, 2018), passengers and drivers, so both sides are considered as customers. They both use the platform, although only drivers pay to use it (and to use services carried by the platform), while passengers pay the driver through the platform, with no additional fees. Therefore, the revenue stream serves as a reference to determine who the customers are (Ritter & Schanz, 2019). Analysing information on their respective websites, we observe that FREE NOW, Cabify and Uber communicate their value proposition in more detail to the two sides.

Two-sided platforms also segment customers based on their business and non-business profile (Skok & Baker, 2018). For example, the websites of some platforms state that they are more focused on passengers in the corporate market (Cabify and JoinUp). Platforms also differentiate customers according to their familiarity with technologies, as it is said

they attract those who are familiar with them and younger generations, such as the Millennials (Kumar et al., 2018; Apte & Davis, 2019; Young & Farber, 2019). This familiarity influences the passengers and drivers they can attract to become customers of the platform. In the case of passengers, they are more willing to book and pay for the services through the app (Watanabe et al., 2016; Skok & Baker, 2018).

The *value proposition* is “the unique mix of product, price, service, relationship and image” that the company offers its customer segments (Kaplan & Norton, 2004). The value proposition for the three business models analysed is shown in Figures 2 to 4. When the value proposition for passengers is considered, it is obvious that new business models have focused on improving the service through the customer journey (Figure 5). Improvements tell customers that they can deliver a better service than the incumbent models (Cohen, 2018). Therefore, they try to differentiate themselves from their competitors through their value proposition (Bohnsack & Pinkse, 2017).

New rivals have entered the market with the aim of upscaling their firms, based on a vision of MaaS (mobility as a service) that enables them to offer different modes of transport besides taxis and VTC services. The research phase in Figure 5 shows that YOUR NOW (Daimler and BMW), Cabify and Uber, have considered alternatives available to passengers so they can grow their firms.

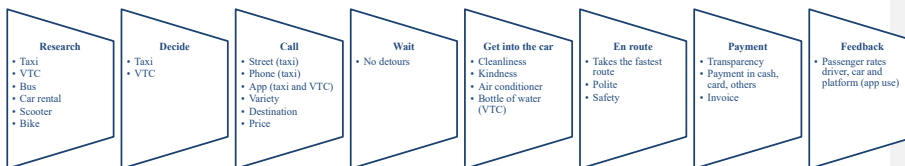


Fig. 5 Phases in the passenger journey
Source: compiled by authors

The value proposition for passengers on their websites (FREE NOW, PideTaxi, Cabify and Uber) states that they offer safety, transparency, affordability, convenience, flexibility and quality. When websites refer to the value proposition for drivers, they state that they offer more services and revenues, security, transparency, flexibility, trust and training.

In the value proposition for passengers, the four cases examined indicated safety as an element of their value. Safety is especially visible on the Cabify and Uber (VTC) websites, stating that specific drivers are identified and the journey is geo-localised. Moreover, all cases refer to transparency as another element, although with different meanings. The two taxi solutions associate transparency with being able to check the route while the passenger is in the taxi and make sure that the driver does not make any detours, while Cabify and Uber relate transparency to passengers knowing how much they are going to pay for the service (Vassallo et al., 2018), therefore giving them the chance to accept or reject this.

Convenience is an important element in relation to taxi and VTC apps. Convenience is linked to requesting the service anywhere, quickly and easily with just one click, to paying through the app and to accepting a variety of payment options (card, PayPal and others). Kumar et al. (2018) added response time to convenience. When taxi solutions are selected, the two cases analysed (FREE NOW and Pidetaxi) specify that they offer passengers a variety of cars, including eco-friendly cars and that they can meet their requirements. They also offer the option of booking in advance. Some platforms have stated that they will offer options for multiple passengers to share routes (Vassallo et al., 2018), thus attracting more price-sensitive customers and maybe new users. This could also confirm that demand is price-sensitive. Finally, rating passengers and drivers is an option included in some platforms (Watanabe et al., 2016; Vassallo et al., 2018; Apte and Davis, 2019). This is a system that enables platforms to control the quality of service, although some studies say this system should be used cautiously because users tend to give higher ratings online (Kumar et al., 2018).

The value proposition for drivers centres on the information contained in the website that indicates they will obtain more passenger services and revenues, although this depends on the network effect, that is, the number of passengers using the platform. The websites focus especially on safety and security, materialised in ratings made by drivers about each passenger, the identification of passengers, geo-localised journeys and the use of non-cash payment methods. Transparency is also present in the value proposition for drivers, but in this case, it is related to the revenues they will receive and their management by the platform. Transparency is also present in the information about places where there is more demand during a particular day. Flexibility refers to the fact that if a driver goes to these

places it is their decision. Trust is also related to revenues and to the assurance that drivers will receive them on a regular basis. Some platforms offer online training to drivers. This is important to assure service quality in an environment where competitors are increasing. According to Anwar (2018), training is especially important for companies focused on customers who are less price-sensitive. Finally, platforms offer to connect drivers without a licence to companies that own licences and need to use them.

The *channels* block indicates how passengers request a transport service. Passengers can hail a taxi in the street, request a taxi by phone, email or via an app. When passengers take a taxi in the street, they buy the service directly from the driver. When passengers request the service through a call centre (usually through a taxi association), the person that receives the call looks for the taxis that are nearest the passenger's location and that meet the customer's requirements. Then, they tell the passenger that a taxi has been assigned to them. When passengers use an app, they indicate their requirements in the app options, then drivers will get a signal that a service has been requested near their location. They accept the service and the passenger receives confirmation. From this moment on, the passenger can check the route followed by the driver via the app and see how long it will take them to get there.

The *customer relationships* block involves setting out the value proposition to customer segments in order to win them over (Kaplan & Norton, 2004). This block also includes customer retention (loyalty), for which service level and customer service (support) are important. As we explained before, to assure a network effect, platforms need to acquire customers on both sides of the equation (Ritter & Schanz, 2019). To attract passengers, platforms like FREE NOW offer promotions and price reductions (Kumar et al., 2018). Promotions are not paid by drivers although they attract more of them due to their expectations of more passengers (network effect).

Segment 2. Value creation

This segment includes the resources and activities needed to create value and deliver it, and the key partners that are essential for the business model's operation.

The *resources* block refers to the assets that the business model needs to work (Osterwalder & Pigneur, 2010). In the taxi driver business model, the driver is the owner of the car, which is an essential resource. Another important resource is the licence associated with their car. In this case, taxi drivers pay all the expenses related to the taxi's

maintenance, insurance, taxes and fuel. Sometimes car owners hire extra drivers to increase the number of hours their asset is used and its associated revenue, although this increases their salary costs.

In business models based on platforms (taxis and VTCs), the main resource is the proprietary platform (including the apps). This platform is valuable to drivers and passengers if it can deliver what is important to customers in their passenger journey (Figure 5) and in the value proposition. For example, the map used to indicate routes indicates the best itinerary with customers selecting the points of departure and arrival. Passengers feel safe because they can check the route followed by the driver while they are in the car. The brand is also an important asset in the business models shown in Figures 3 and 4, because it can help to attract customers.

Compared to the taxi drivers' business model, the owner of the platform does not incur in any vehicle costs because these vehicles are not their assets. Expenses related to car maintenance and operation are paid by drivers (FREE NOW) or by the company which hires them (companies that own the majority of VTC licences and that use the Cabify and Uber platforms in Spain). Therefore, in the business models shown in Figures 3 and 4, licences are not the resources of companies offering a platform for drivers and passengers. The exception is Cabify, which bought a company to obtain the ownership of many licences and thus not depend on the companies that control a large share of these licences. Another important resource of the business models in Figures 3 and 4 is the client database and all the data they can obtain through call centres and apps. Moreover, there is a very important resource in platform models, which are the algorithms they can develop to transform data into knowledge and offer new services to customers. For example, FREE NOW developed the Taxi Butler, a device for hotels that sends a taxi to a hotel by pushing a button.

The *activities* block includes the elements that the business model needs to function (Osterwalder & Pigneur, 2010). In the taxi drivers' business model, drivers do the majority of activities, except WHEN they decide to work with a call centre or with a platform. If they decide to work with a platform, they are responsible for the expenses of their taxi but they co-deliver the entire service in conjunction with the platform. Drivers deliver the transport service while the platform delivers the app related to the service. Therefore, the

sales and marketing service is performed by the platform for the driver. As they co-deliver the entire service, failures in quality in one of them will affect the other.

In the business models in which there is a platform with an app (Figures 3 and 4), the activities carried out by companies are related to the development and management of the platform (Apte and Davis, 2019). Once the platform is developed, they need to attract sufficient drivers to ensure low waiting times for passengers and negotiate the fees for the use of the platform (Kumar et al., 2018).

The *Key partnerships* block refers to suppliers and partners (resulting from joint ventures and strategic partnerships) who are essential to firms' business models (Osterwalder & Pigneur, 2010). The main partners of the taxi drivers' business model are taxi associations (some of them offer taxi maintenance), car manufacturers, government, call centres and platforms, and payment system companies. The main partners for platform business models are ICT suppliers, Google (for maps), and payment system companies, such as credit card companies (Apte & Davis, 2019).

Segment 3. Value capture

This segment involves the revenue model, the major costs in the business model and the profitability of the model.

In terms of the *revenue model* of the taxi drivers' business model (Figure 2), fares are regulated by local governments, although the final price the user is charged is not negotiable. Their revenue comes from cash payments made by customers at the end of every journey. They can obtain additional revenues through advertisements on their cars. However, to obtain more stable income they need to contact specific customer segments, such as firms, hotels and shops. The study available for Madrid (Vectio, 2017) indicates that the annual revenue of a taxi driver working a single shift was around €45,000, while revenues were around €71,000 when the taxi worked two shifts.

Platforms aim to upscale their business models so their focus is on gaining as much revenue as possible, from investors and from sales (driver fees). Platforms are starting to offer fixed rates to passengers, informing them of the price before the service, in the belief that this will increase the number of users and revenue. Moreover, their strategies are based on mobility, so they are offering more services and products like bicycles, scooters and electric cars for rental, transforming their model into one lead using "transportation as a service" (Cusumano et al., 2019) to increase their growth opportunities. Lastly, some

applications include advertisements on their apps. On the other hand, if users install an app (Cabify, Mytaxi, Uber) they can use it to see how to get to a place through Google Maps and see Google's advertisements.

The main expenses a driver has in terms of *costs* are associated with the purchase of the car and the licence, the maintenance of the car, fuel, insurance and fees payable to associations, call centres and platforms. The cited study in revenue streams (Vectio, 2017) indicates that the annual costs of a taxi driver working a single shift are around €16,000, while costs are 35,000€ when the taxi works two shifts. The operating margin calculated in the study was €29,999 in a single shift and €36,200 in two shifts.

In platform models, the main costs are related to platform development, maintenance and management, including marketing and sales, office expenses and employees in these offices. If platforms achieve their network effect, this will help them to achieve economies of scale thus bringing lower costs per unit.

Are business models based on taxi licences more *profitable* than those based on VTC licences? The study cited before (Vectio, 2017) confirms that taxis obtain positive operating margins and these rise when drivers increase the use of their taxi by adding an extra shift. When consulting the SABI database (<https://www.bvdinfo.com/en-gb/our-products/data/national/sabi>), profitability was positive for taxi companies but negative for MyTaxi. When models based on VTC licences were checked, profitability for Uber Spain was positive in 2017 but negative for Cabify and for the three companies that own the majority of licences. However, both types of licences have increased their value in secondary markets, and this value is higher than the revenues that a licence can generate in a year.

As pointed out previously, the market analysed is highly fragmented. Moreover, when the service offered is perceived by customers as being standardised with firms having little influence on prices, the sector will be closer to perfect competition and this will lead to a less profitable market (Rothaermel, 2019).

Discussion

We have found that the collaborative economy is capable of finding new ways to develop its business models. MyTaxi announced the expansion of its business with FREE NOW!,

in which Daimler and BMW aimed to work with other firms such as Car2go and Drive Now to offer an integrated service including car sharing, taxis, public transport, electric scooters and motorbikes (MyTaxi, 2019). This is in line with Standing et al. (2018) when they proposed holistic transport strategies that consider sharing options. Moreover, Terrien et al. (2016) reviewed both public and private experiences through a case study analysis with five one-way carsharing services in Europe (Paris, Munich) and the United States (San Francisco, Portland, Seattle). They concluded that transforming urban mobility requires integrating public and private services into a single transportation system, with local governments and private companies facing the challenge of how to coordinate their efforts through different public-private partnership formulas.

However, VTCs face profitability obstacles due to the regulations that have forced some companies to leave local markets (Uber decided to leave Barcelona and Valencia in June 2019). Moreover, regulation also affects taxi prices, as they are not able to adapt rates to demand as platforms can. Regulation in the number of licences reduces the scalability of platforms, which might explain why these business models are diversifying into other services as they cannot attain the expected growth levels.

However, these collaborative platforms (FREE NOW, Uber and Cabify) are aware that their business models need both sides to be successful and to create “network effects” (Täuscher & Kietzmann, 2017; Apte and Davis, 2019; Cusumano et al., 2019). All of them offer customer service for both passengers and drivers. However, gaining loyalty is difficult in a service in which switching costs are very low for passengers and multi-homing is difficult to eliminate. This means that passengers use different platforms and have access to apps that offer fee comparisons. This behaviour is likely to become more popular in the future considering that FREE NOW, Cabify and Uber have started to offer multi-homing solutions. On the drivers’ side, platforms also deal with multi-homing in drivers’ cars. This is solved by using highly visible stickers on the taxis (FREE NOW and Pidetaxi) or a specific car colour (Cabify).

Stating and fixing prices in advance will probably be the rule in the short term, as some taxi platforms have already started to do (FREE NOW, when payment is made via the app). This would confirm that passengers that use taxis and VTC services are price-sensitive, although some studies indicate that passengers would be prepared to pay more for two-sided platforms (Kumar et al., 2018; Clauss et al., 2019). To reduce the effect of

low switching costs, platforms are also bringing down their prices. However, Clauss et al. (2019) stated that loyalty depends on customer satisfaction more than on price. Therefore, platforms should focus on delivering a good service and a good value proposition. Accordingly, positive feedback about passengers' experiences will lead to repeat purchases. Conversely, the difficulties of retaining passengers appear when drivers deliver low quality service or they do not know the city streets (Kumar et al., 2018) and end up making detours.

Attracting users from both sides (passengers and drivers) to the platform (Andreassen et al., 2018) is an essential activity in this business model. The platforms in the market are upscaling their business models which means they need to carry out all the activities required to increase revenues quickly. These activities include sales and marketing, organising internal growth processes, and increasing capital investment (Cohan, 2019). Moreover, they need to hire experienced managers that ensure growth is reached (Love, 2016).

Platform companies are using differentiation strategies to try to consolidate the market (Barney and Hesterly, 2015), although Kumar et al. (2018) stated that these models are easy to imitate, which makes it difficult to create a sustainable competitive advantage.

Other business model failures that reduce profitability have been observed. According to Täuscher & Kietzmann (2017) different failures in the market could be analysed. The first is related to changes in the revenue model that increase the fees charged to users. As mentioned above, switching costs to change from one service provider to another are low and users are price-sensitive, so a reduction in prices and a greater number of promotions offered by some platforms might reduce customers in others. Increased competition between traditional taxis, apps and platforms in Spain could lead to this situation, especially if demand does not grow at the expected rate for scalability. The second failure is related to poor control over service quality. This situation could arise in Spain when platforms and taxi associations are more interested in the network effect than in the quality of that network. Therefore, it is important that they consider the passenger journey (Figure 5) and establish systems that measure service quality. The third failure is connected to the costs of attracting customers, i.e. passengers and drivers, on both sides. Increased competition in Spain and the entry of more competitors means that companies are

competing for drivers with licences (taxi and VTC), but the number of these licences is regulated and limited. Therefore, the cost of customer acquisition is higher than the revenues obtained from them.

Conclusions

We have analysed how the passenger transport sector could become more cooperative. First, by studying how deregulation affects different stakeholder groups in order to engage them (Jansson, 2010; White, 2019), focusing on the recent case of Spain. Second, we examined how collaborative economy business models work (in this case, private transport services) and how they could align incentives with key stakeholders to ensure the longevity of their operations (Cohen and Kietzmann, 2014:294; Täuscherand and Kietzmann, 2017). The collaborative economy forces us to reconsider different traditional business models, especially taxi services, taking into account all the stakeholders. In this new context, government needs to protect all the parties' rights to prevent some of the groups involved from obtaining a superior position. In the case of Spain, we observed that the taxi sector has been prioritised by the central government as well as by some regional governments. Instead of focusing on improving VTC drivers' labour conditions, the authorities are focusing on restricting their services and, therefore, preventing them from accessing the labour market. In fact, companies such as Uber have abandoned passenger transport services in some Spanish cities (Valencia and Barcelona) due to the restrictions adopted by their respective local governments. Though proposals have tried to respect competition on equal terms through a change in regulations that matches the conditions of service provision and the tax regime and working conditions of the parties involved (Boix Palop, 2018), the reality is that VTCs have not been given a satisfactory solution. Accordingly, the requirements for licences and fees should be relaxed and there should be no exclusivity when working for a platform, and a system of compensation for taxi drivers similar to the Australian idea should be implemented (Gómez Frías, 2018).

At the beginning of our work, we proposed some research questions that have been answered in this study. RQ1: what is the collaborative economy? Are VTC platforms part of the collaborative economy? The idea of platforms such as Uber and Cabify is to make a profit and therefore we cannot consider them as part of the sharing economy, such as car sharing. Perhaps it would be more appropriate to call them on-demand economy platform

organisations. As Standing et al. suggested (2018), the objective of a real sharing economy will need to be integrated into transport planning. Data will need to be shared with the platforms to discourage single-occupant vehicle travel and to find a new legal framework that takes into account the specifics of innovative practices. However, this is not the aim of these companies. Therefore, they could be called collaborative but certainly not sharing, although it would be more appropriate to start calling them “on-demand economy platforms”.

RQ2: who are the stakeholders involved? As we have seen in Figure 1, different stakeholders are involved yet there is a lack of analysis at different levels of government as to how passenger transport deregulation affects different stakeholder groups in order to engage them. In particular, users have been totally excluded from the legal regulation process.

RQ3: why is there conflict between the taxi sector and some VTC companies? There is increased competition between them because they are all trying to attract the same users. However, their objectives are different and this could be a starting point to move towards measures of consensus. The new generations are more familiar with technology and they will be the future target audience, but also its future drivers.

RQ4: how are these business models evolving? The fact is that, over the last few years, we have witnessed major changes in transport, especially centred on individual and eco-friendly solutions such as electric bikes and scooters, and therefore it is necessary to adapt to this new environment. In our opinion, even if the taxi sector follows a traditional business model in Spain, the role of government should not be to protect it but to ensure it adapts to this new environment. From the point of view of the taxi sector, more coordination will be needed. For example, integrating their services into a single intermediate platform (e.g. PideTaxi). In addition, it could also offer the same services as the Uber and Cabify platforms. On the other hand, labour conditions should be the priority for regulation. We have observed that there are often no joint solutions, which leads to conflicts between taxi and VTC drivers. Ironically, end users are totally absent from the process which is quite unusual given that the taxi sector is essentially a public service.

Therefore, it seems obvious that the role the public sector must play is essential in the transition from the current regulatory framework to a new scenario that takes into account

the natural evolution of the sector, in which a large number of actors are involved. The difficulty of establishing a policy-making process based on the theory of rationalism suggests making incremental changes that involve three conditions: all social interests must be taken into account in the process of adapting policies; no single stakeholder or group of stakeholders should have a dominant role over the rest; and the political decision-makers must be moderate and pragmatic, enabling the process to evolve constantly (Hayes, 2017).

Some studies have concluded that the presence of Uber and Lyft in some North American cities complements public transport in some cases (Lee et al., 2018; Hall, Palsson and Price, 2018). Therefore, government needs to promote conclusive analyses on the real impact of these new models and, when appropriate, establish public-private partnership models to improve the transparency and regulation of these activities. Some papers have analysed some MaaS projects from a multi-level governance perspective (Audouin and Finger 2018) and from a comparative approach (Smith et al., 2018).

Another measure to adopt may be encouraging a peaceful transition towards liberalisation and the elimination of high entry barriers, such as those existing in the taxi sector, and proposing possible ways for compensation. Likewise, the analysis of certain regulatory precedents of other activities in digital environments could help in this transition process. In any case, the public sector should see that cases such as VTCs are a great opportunity to deregulate and boost the non-competitive taxi industry, which finds it difficult to meet the current demands of users in the same way as the new business models reviewed in this work are able to do.

The present study obviously has some limitations in relation to the methodology proposed. First, because it is centred on the case of Spain and the results could be different in other countries. Second, because we have analysed content qualitatively from secondary sources and some information could be interpreted differently. For these reasons, future research could focus on analysing primary information from end-users (passengers) as we have noticed that this group is missing from the public debate.

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