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POLICY DEPARTMENT **A**
ECONOMIC AND SCIENTIFIC POLICY



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**Internal Market and
Consumer Protection**

Digital Services in the Area of Accommodation and Transportation: Economic and Legal Aspects

In-Depth Analysis for the IMCO Committee

DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Digital Services in the Area of Accommodation and Transportation: Economic and Legal Aspects

IN-DEPTH ANALYSIS

Abstract

This paper examines the development of digital business models in the provision of flights and short-term accommodation services. It discusses the growing importance of digital intermediaries and their associated business model features, some of which provide significant value, and others which could be considered deleterious and in need of regulatory scrutiny. The paper concludes with some suggestions for regulation based on technology, algorithms and big data analytics. This could enable a more soft-touch, automatic, dynamic and individualised approach to regulation.

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EXECUTIVE SUMMARY

The Internet and software applications on mobile devices have profoundly changed the way that consumers purchase transportation and accommodation services. Digital platforms for purchasing transportation and accommodation services have become increasingly important in the European Union in the last two decades, while in parallel, offline travel sales have declined. The last 20 years has seen massive consolidation of global online intermediaries, increasing market power and their overall share of sales. More recently, direct sellers of travel services have attempted to build market power and to use marketing strategies to regain a larger share of sales.

Digital business models provide significant benefits to consumers and society. More generally, they have been important in driving sales of transportation and accommodation services since 9/11. However, digital business models also include notable elements requiring regulatory scrutiny. In the airline travel market, customer profiling raises concerns regarding data protection, privacy and fairness. Similarly, there are concerns regarding online pressure selling techniques, tax avoidance, geo-blocking, price competition and additional booking fees imposed by websites.

In the short-term accommodation sector, new business models based on collaborative consumption have rapidly captured sales. These platforms provide significant potential benefits for consumers, businesses and society. Notwithstanding, these new platforms (such as Airbnb and HomeAway) also pose notable risks, including issues of negative externalities, privacy and data use, taxation, safety and liability, peer discrimination, fair pricing, and the quality of trust platforms. Currently, regulation for the new business model is patchy and inconsistent within the European Union, and a unified approach is desirable.

Data and algorithms are the foundation for some of the economic and legal issues associated with the new platforms, but with creative legislation, they also provide the instrument to solve some of these problems. In order not to restrict the successful growth and benefits of the new business models and to reduce the regulatory burden on the European Commission, solutions should be soft-touch, automatic, individualised, and dynamic. Big data analytics provides the potential mechanism to enable such advanced regulatory solutions, including those related to issues of tax conformity, peer discrimination, review and rating asymmetry, privacy breaches, negative externalities, and unfair pricing.

1. INTRODUCTION

Digital accommodation and transportation are rapidly developing areas of service provision that provide tremendous benefits for consumers, businesses and economies of Member States, but that also pose risks that require more attention in terms of regulation and policy.

The European travel market is extremely important to the EU economy. The market – including air travel, hotels, rail, car rental and tour operators – was worth around €264 billion in 2015 and estimated to grow at around 3% per year to €282 billion in 2017¹. There were 918 million air passenger journeys in the EU in 2015, a growth of 4.7% from 2014².

More than half of all travel revenue is now booked online. This is a higher proportion than the US or Asia. The percentage has grown in the last few years, particularly as Germany, Italy and Spain have taken advantage of improved mobile and website experiences from suppliers and intermediaries. By far the largest share of revenue comes from online travel agents (45%), followed by around a third from direct airline flight bookings³.

A new strand of growth in online travel has come from sharing economy business models. The sharing economy in the EU is growing fast. According to Eurobarometer (March 2016), 17% of EU adults have used sharing economy services⁴. This compares to only 5% in a study by ING in July 2015⁵. This varies widely, with France at 36% and Ireland 35%, whilst the UK, Belgium and Portugal were found to be only 8%⁶. The largest economic gains are predicted to be from car sharing, which was highest in economic value and cost in study by Fremstad in the US⁷. This is borne out in the European data and sharing economy transportation revenues were estimated to be €1.65 billion in 2015, followed by accommodation services at €1.15 billion⁸. However, this situation is reversed when we look at transaction value, with accommodation services the largest at €15.1 billion. A few large, global players have begun to dominate the provision of accommodation services in the sharing economy. For example, Airbnb's market value rose to \$31 billion in 2017⁹. More than half of Airbnb's listing (58%) are in Europe¹⁰.

The contents of this paper are as follows. The next section discusses the transformation of service provision in accommodation and transportation as a result of the digital revolution, particularly through the Internet and ubiquitous mobile computing. This involves taking a deeper look into the types of services provided, including an examination of the business models, operation and components, with a particular focus on the most valuable elements and those that pose possibly deleterious effects on consumers or other stakeholders. This will lead to a critical assessment of the business models, particularly with respect to the newest form of business model, collaborative consumption in accommodation services.

Finally, the paper concludes by identifying opportunities for policy improvement and actions that could assist in solving current problems posed by these services for the emerging digital single market.

¹ Juman, D., Merten, R. and Eisenbeis, F. (2016). *European Online Travel Overview. 11th Edition*. New York: Phocuswright.

² Eurostat (2016). Air Transport Statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Air_transport_statistics

³ Juman et al. (2016). *Op. cit.*

⁴ European Commission (2016a). *Flash Eurobarometer 438*. Brussels : European Union.

⁵ ING/Ipsos (2015). *ING International Survey*. London: ING.

⁶ European Commission (2016a). *Op. cit.*

⁷ Fremstad, A. (2014). *Gains from Sharing: Sticky Norms, Endogenous Preferences, and the Economics of Shareable Goods*. Economics Working Paper 168. University of Massachusetts, Amherst.

⁸ Vaughan, R. and Daverio, R. (2016). *Assessing the Size and Presence of the Collaborative Economy in Europe*. London: PwC.

⁹ BBC (2017a). Airbnb Raises \$1 Bn of Investment Funding (9/3/17). <http://www.bbc.co.uk/news/business-39224820>

¹⁰ Airbnb (2014a). *Airbnb Growth Europe*. <https://blog.airbnb.com/airbnb-growth-europe/>

2. BUSINESS MODELS

KEY FINDINGS

Digital platforms for purchasing transportation and accommodation services have become increasingly important in the EU in the last two decades. Offline travel sales are declining rapidly. Global online intermediaries have consolidated and are now dominant in terms of their share of sales. Direct sellers of travel services have attempted to build market power and to use marketing strategies to regain a larger share of sales.

Digital business models provide significant benefits to consumers and have been important in driving sales since 9/11, but they include notable elements requiring regulatory scrutiny. In the airline travel market, customer profiling raises concerns regarding data protection, privacy and fairness. Similarly, there are concerns regarding online pressure selling techniques, tax avoidance, geo-blocking, price competition and additional booking fees imposed by websites.

2.1. Generalised View of Business Model Transformation

Business models have been radically transformed by the Internet and related technologies over the last 20 years. 'Traditional' business models focus on building the best knowledge, operations and physical assets to provide products or services to the consumer. Examples include hotels (e.g. Hilton), car rental companies (e.g. Avis), and airlines (e.g. British Airways). These business models are heavy in sunk costs for assets. They tend to be inflexible and difficult to scale quickly, because to do so requires purchasing more assets. This is a push-based model, whereby goods and services are created and sold through a traditional, linear supply chain: manufacturers produce goods, which are distributed and then sold to consumers through retail channels. The exchange between consumers and providers tends to be dyadic – just two parties are involved. Firms tend to focus on improving the efficiency of operations in the supply chain and on building industry knowledge and competencies for competitive advantage¹¹.

Newer, 'transformed' business models are digitally enabled, scalable and customer-focused. Services tend to be available immediately, at all times, wherever there is an Internet connection. For example, Airbnb could be used for accommodation instead of a hotel, Uber instead of a taxi, a hotel or a flight could be booked through Booking.com, a consumer could find out about hotels or flights through TripAdvisor and then make a booking. Business models have been assisted by: the proliferation of smart devices such as smartphones and tablets; the provision of near-ubiquitous connectivity to the Internet for devices; the development and acceptance of mobile payments infrastructure; social-media based trust and verification systems; and advances in the collection and analysis of big data. Globally, the number of Internet users is estimated at 3.8 billion (50%), the number of mobile social media users at 2.6 billion (34%), and the global population at 7.5 billion¹².

New business models tend to be light on asset base, through, for example, outsourcing or asset provision by crowds of peers. Since models are network-based, they tend to be more flexible and easier to scale up or down according to demand. Rather than push, the focus tends to be on pull and customer demand, and providing a high quality service/experience for the consumer. The business models focus on multi-sided platforms that facilitate

¹¹ Gesing (2017). *Sharing Economy Logistics*. Troisdorf: DHL Trend Research.

¹² Hootsuite/We Are Social (2017). *Digital in 2017*. New York: Hootsuite/We Are Social.

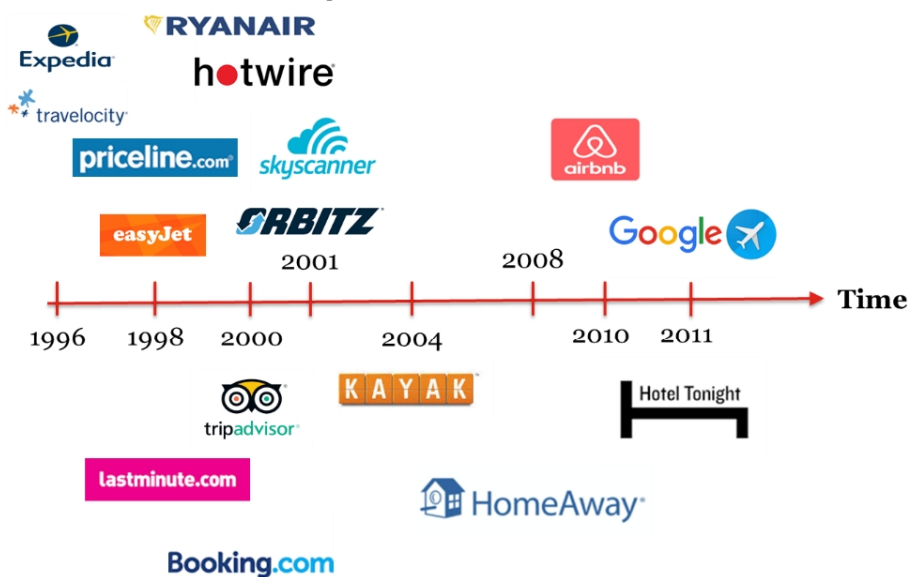
transactions between consumer and provider. Thus, the consumer deals with more than one party – the service platform and the service provider.

The core value of these platforms is contained within the advanced software used to match supply and demand and manage the customer experience.

2.2. Online Travel Industry Timeline

Figure 1 shows a brief, selective overview of the development of online travel services over the last 20 years or so.

Figure 1: Online Travel Industry Timeline



Source: Author.

Pre-dating this timeline American Airlines developed its SABRE computerised reservation system (CRS) in 1959, United Airlines developed the Apollo CRS in 1971, and Travicom was developed in the UK in 1976 (which became Galileo in 1992). Tim Berners-Lee developed the World Wide Web in 1989, which then became used by businesses in the early to mid-1990s.

1996. American Airlines founded Travelocity based on SABRE. This was the first website platform for consumers to book and purchase travel products (airfares, hotel rooms, and car rental) without a physical intermediary. In the same year, Microsoft founded Expedia, which operates as an online merchant, buying flights and hotel rooms and reselling them to consumers at a margin.

1998. Priceline.com is founded, offering a 'name your own price system' for travel products, whereby consumers specify general location, service level and price; the exact details of the product are only revealed after purchase with no rights to cancel. Lastminute.com is founded, operating by selling off unsold travel inventory at discount – again it does not identify participating companies until after purchaser has paid so as not to compete with retail sales. EasyJet, the low-cost carrier launches its direct sales website.

2000. Hotwire is launched, using a similar business model to Lastminute.com. Tripadvisor launches – an early adopter of user-generated content. The website services are free to users, who provide most of the content. The website is supported by a advertising business model and later by a hotel booking facility. Booking.com is formed by merger of Dutch online businesses. Booking.com keeps no inventory; it has contracts with suppliers and sells on a commission basis. Ryanair, the low-cost carrier launches its direct sales website.

2001. Galileo's parent company Travelport launches Orbitz as a response by major airlines to the rising success of Expedia and Travelocity and to lower costs. Orbitz is a fare aggregator and metasearch engine.

Skyscanner is launched, another fare aggregator and metasearch engine. The 9/11 tragedy has a huge impact on international travel and the Web becomes a key channel for offloading unfilled inventory.

2003. Hotwire and Expedia merge.

2004. Interactivecorp/IAC Expedia acquires Tripadvisor. Kayak is launched – another fare aggregator and metasearch engine. The site collects details of products for customers to search and select, and then directs customers to other websites for completion. Revenue is collected for distribution and advertising.

2005. Priceline acquires Booking.com.

2008. The Apple iPhone is launched, providing a major driver for Internet adoption and online booking on the mobile phone. HomeAway is launched, a peer-to-peer vacation rental marketplace with more than 1m rentals in 190 countries¹³. It operates via subscription fee and later a booking fee for visitors.

2010. Airbnb is launched: a peer-to-peer marketplace where home or property owners can share their space for short-term rental. Airbnb earns a percentage of fees.

2011. TripAdvisor public offering. Google Flights purchases ITA software and launches Google Flights. This enables open-ended searches and visualisation of options by criteria other than destination, such as times, budget and destination choices. Revenue is based on advertising. Mobile app Hotel Tonight is launched, enabling immediate purchase of discount hotel rooms.

2013. Priceline purchases Kayak.com

2015. Expedia purchases Travelocity, Orbitz and HomeAway.

2.3. Key Trends and Players in the Travel Industry

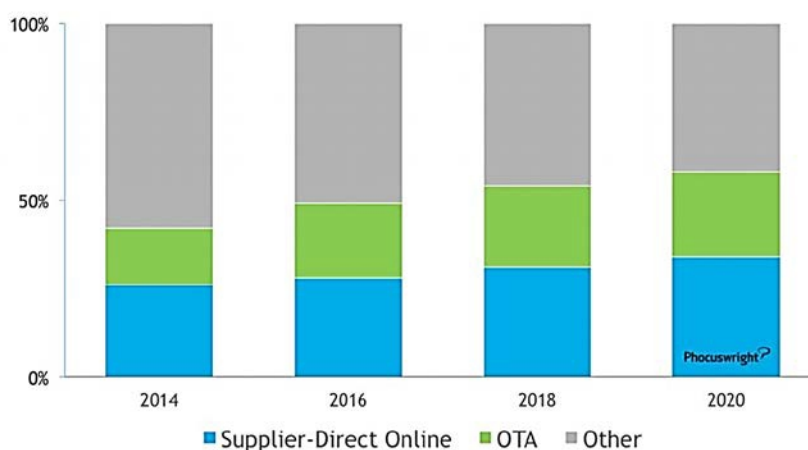
Throughout the last 20 years, there has been considerable consolidation in the travel industry, for all types of players, large and small. This includes traditional travel agents, hotels, airlines and online travel agents. This has led to a concentration of powerful players. For example, Priceline now own Booking.com, Kayak.com, Cheapflights, momondo, and many other top online intermediaries. Similarly, Expedia owns Hotels.com, Hotwire, Travelocity, Orbitz, Cheaptickets, HomeAway, trivago, and many other leading intermediaries.

In the airline industry, over the last two decades, low cost carriers such as Ryanair (now 1st in terms of passenger numbers in Europe) and EasyJet (5th) have taken an increasing share of the price-competitive short-haul market in Europe (and now dominate the short-haul, no-frills market)¹⁴. This has weighed heavily on the costs and profitability of other European operators and has influenced mergers and acquisitions to the current situation with fewer carriers dominating the full service market, particularly for medium-long haul: Lufthansa, IAG, and Air France-KLM. Such players have increasing market power.

Figure 2 demonstrates the increasing pressure from online sales channels. Traditional travel agents are still a key distribution channel in Europe, particularly in southern Europe (such as Italy and Spain). However, the offline share of travel bookings is estimated to fall to 42% by 2020¹⁵. Recent growth in online bookings has been particularly driven by the use of mobile devices and social media. It is becoming increasingly difficult for traditional travel agents to compete against the online platforms of suppliers as airlines (e.g. IAG and Lufthansa) and hotels (Marriot, Hilton), and digital intermediaries such as Booking.com and Expedia.

¹³ HomeAway (2017). *Company Description*. <https://www.homeaway.co.uk/info/about-us/company-description>

¹⁵ Juman et al. (2016). *Op. cit.*

Figure 2: European Travel Market – Share by Channel

Source: Phocuswright (2016)¹⁶

Table 1 provides indicative information on sales revenue for key companies in the global travel market. This enables us to compare the scale of activity between the different business models and companies. The large travel intermediaries, Expedia and Priceline, are the largest of all in terms of sales in 2016 at \$72 billion and \$68 billion respectively. Their sales dwarf those of providers and other intermediaries: around twice those of the large European airlines and more than five times those of Marriott and Hilton. However, note that these intermediaries only earn a fraction of sales as revenue, typically around 10-15%. Priceline made \$11 billion in revenue in 2016, whilst Expedia earned \$9 billion¹⁷. Direct sellers cannot sell at a lower price than OTAs such as Booking.com due to a price parity clause, which protects revenues.

Table 1: Key Global Players in the Travel Industry by Sales

Travel Companies (2016)	Airlines (2016)*	Accommodation (2016)
1. Expedia Inc. (\$72Bn)	1. American (\$40Bn)	1. Marriott (\$17Bn)
2. Priceline Group (\$68Bn)	2. Delta (\$40Bn)	2. Hilton (\$12Bn)
3. American Exp. GBT (\$31Bn)	3. United Cont. (\$37Bn)	3. Airbnb (\$12Bn)**
4. BCD Travel (\$25Bn)	4. Lufthansa (\$35Bn)	4. Wyndham (\$6Bn)
5. Carlson Wagonlit (\$22Bn)	5. Air France-KLM (\$28Bn)	5. Accor (\$6Bn)
6. HRG North America (\$16Bn)	6. IAG (\$25Bn)	6. Host (\$5Bn)***
7. FC USA (\$14Bn)	7. Southwest (\$20Bn)	7. Hyatt (\$4Bn)***
8. American Express (\$5Bn)	8. China Southern (\$17Bn)	8. Jin Jiang (\$3Bn)
9. Travel Leaders (\$4Bn)	9. All Nippon (\$16Bn)	9. Intercontinental (\$2Bn)
10. Fareportal (\$4Bn)	10. China Eastern (\$15Bn)	10. Extended Stay (\$1Bn)***

Source: Travelweekly (2017)¹⁸; Forbes (2017)¹⁹; Cowen & Co. (2016)²⁰; annual reports; *inter alia*.

Notes: * Emirates not included; **reported estimate; *** 2015. This table is compiled from secondary sources; it is indicative but accuracy is not guaranteed.

¹⁶ Phocuswright (2016). *Op. cit.*

¹⁷ Forbes (2017). *Op. cit.*

¹⁸ Travel Weekly (2017). *Travel Weekly's 2017 Power List*. <http://www.travelweekly.com/For-Travel-Agents/Power-List>

¹⁹ Forbes (2017). *The World's Biggest Public Companies*. https://www.forbes.com/global2000/list/#header:revenue_sortreverse:true_industry:Airline

²⁰ Tnooz (2016). *Airbnb is forecast to have \$12.3 billion in bookings in 2016*. <https://www.tnooz.com/article/airbnb-is-forecast-to-have-12-3-billion-in-bookings-in-2016/>

One of the most interesting findings in Table 1 is that new player Airbnb's sales are estimated to make it the 3rd largest global provider of accommodation in 2016 when compared to hotels.

As an intermediary, Airbnb earns only a fraction of sales as revenue, estimated at \$2 billion in 2016 and predicted to rise to \$3 billion in 2017²¹. Aggressive tax planning and avoidance have contributed to its earning power²².

Hotels and airlines are now using extensive marketing campaigns, technology and techniques to claw back business from Expedia, Priceline and other intermediaries. Priceline and Expedia were critical for hotels and airlines during the downturn after 9/11, but have since gained an increasing share of the overall bookings of direct sellers and have also become larger through inorganic growth. Since 2002, various hotels and airlines have temporarily removed their products from Expedia and Priceline due to disagreements about commissions. Most recently, Delta deleted flights from price-comparison sites and OTAs in 2013-14 and not all have been reinstated. Hyatt pulled hotels from Expedia in 2017.

Recently, large hotels such as Hyatt, Hilton and Marriot have started selling rooms at a lower prices to loyalty program members in an attempt to avoid price parity clauses and to build long-term customer loyalty. Some hotels offer additional benefits to those who book directly through their website, e.g. Free WiFi or 'choose your room'.

Airlines have also attempted to build in mechanisms for platform differentiation, particularly through introducing fees for bookings that are not made on their own CRS. Lufthansa introduced a €16EUR surcharge and extra charges for bags, whilst AIG introduced a similar €9 fee.

2.4. Basic Business Model Structures

At its most basic, the business models can be broken down into two types, direct sales and intermediary. In the direct sales model, there are two parties in a transaction. The consumer orders a product or service from the provider. The provider sells the product, rents the product, or provides the services using their own assets and capabilities. In return, the customer pays the price/fee for the product or service. For example, hotels and airlines can sell their products online directly to consumers, such as IAG (incl. BA, Aer Lingus, Iberia), Lufthansa, Hilton and Marriot.

In the basic intermediary model, there are typically three parties in a transaction. The consumer visits an intermediary to find out about products, prices, providers, etc., with the aim of purchasing flights or hotel rooms. Twenty years ago, high-street travel agents such as Thomas Cook and Thomson fulfilled this role. With the rise of the Web in the mid- to late-1990s, new digital intermediaries were created. These intermediaries fulfil different functions. The intermediary may: purchase products/services in bulk and sell them directly to consumers (the merchant model); have agreements to list certain products and services and sell them at a commission (agency model); provide information on products and services and enable bookings, being funded largely by advertising (infomediary); or focus on providing comprehensive aggregation of products and prices and a meta-search engine (price-comparison). Of course, intermediaries can also be a combination of these, particularly the first three. Ultimately, products and services are delivered by the provider, the airline or hotel, and paid for by the consumer – with a share of monies going to the intermediary and provider according to the specific revenue model.

²¹ Forbes (2017). *Airbnb's Profits to Top \$3 Billion by 2020*. <http://fortune.com/2017/02/15/airbnb-profits/>

²² BC (2017b). *Airbnb paid £188,000 in UK tax last year*. 8th October. <http://www.bbc.co.uk/news/business-41543449>

2.5. Airline Travel Business Models

In simple terms, we can identify six different business models for airline ticket sales.

Direct Sales involves the supplier selling flights to consumers through their own app or website for a given price, e.g. Lufthansa. The choice is limited to the supplier, but there may be certain benefits to doing this, such as building a stronger customer relationship and loyalty, better customer service, personalisation, cost and price control (avoiding intermediary costs), and a better range and availability of services.

A **Price-Comparison Platform**, such as Kayak.com, provides consumers with travel information and rates on flights, hotels, etc., typically with a very comprehensive choice. Kayak had 1.5 billion customer inquiries in 2016²³. Kayak acts as a search engine for the best prices and does not handle sales transactions, rather it refers users to other websites to complete transactions. It provides a low cost model with few employees. Revenue comes from distribution fees and advertising: 30% of revenue from airline referrals, 15% for hotels and car rental referrals, and 55% from advertising on the website by travel businesses. Kayak can charge premium advertising rates due to its high visibility.

We can identify three types of online travel agent (OTA). These have some similarities, but also notable differences in terms of their dominant business model revenue sources²⁴.

- **Online Travel Agency (Agency)**. Priceline owns Booking.com. It has contracts with hotels and airlines that it lists and it takes commission on each booking of around 10-30%. This represents around three-quarters of its revenues. The commission influences the search ranking that consumers see. No inventory is owned, and the model has low fixed costs. Booking.com can also claim to have the cheapest prices, particularly due to a rate parity clause with providers. The platform has a huge choice of products and useful and persuasive online content, with a trust platform aimed at reducing perceived risk for consumers.
- **Online Travel Agency (Merchant)**. Expedia makes the majority of its revenues (around two-thirds) from buying flights and hotels rooms and then reselling them to travellers at a margin. Often these are sold as a package. This model has high variable costs to buy inventory before waiting for sales and payment. Expedia makes other revenue from commission and advertising.
- **Online Travel Agency (Infomediary)**. TripAdvisor focuses on user-generated information provision to inform the selection of a hotel, often the most expensive item on a vacation. Free information and reviews from guests allow research into the accommodation. A comprehensive trust platform is used for risk reduction. The majority of revenue (80%) is earned via advertising. Transaction revenue also generated through direct bookings, earning 12-15% commission. TripAdvisor have contracts with some leading hotel chains.

Traditional Travel Agencies (TTA) source holiday components, such as air travel and accommodation (or provide it directly, e.g. Thomas Cook has its own airline), and sell them either on a packaged or component-only basis to consumers via commission or markup. Traditionally this was through high-street stores and offline channels, but it has moved online and multichannel, including via online affiliates. Traditional travel agents may have a trusted brand, high quality customer service, high quality customer experience, expertise, and customer loyalty. This model has high fixed and variable costs.

²³ Maverick, J.B. (2016). How Kayak Makes Money. <https://www.investopedia.com/articles/company-insights/082816/how-kayak-makes-money-pcln.asp>

²⁴ Innovation Tactics (2017). Business Models Compared: Booking.com, Expedia and TripAdvisor. <http://www.innovationtactics.com/business-models-tripadvisor-booking-com-expedia/>

2.6. Airline Travel Business Models

There are many notable features of the business models that add value or differentiate offerings²⁵. These include the following.

Product Range. Direct sellers are typically limited to their own products or those of partners (e.g. airline code sharing), whereas intermediaries tend to have a broader range of products. However, the product range of intermediaries may be selective or incomplete due to certain supplier agreements, whilst direct sellers may provide some 'exclusive' products.

Channels: Reach, Speed & Availability. Online services are typically available immediately, at all times, wherever an Internet connection is available. Models with an offline component are thus more limited, although most traditional travel agents are now multichannel. The quality of the Internet connection affects speed and availability, which is lower in some Member States. Access to some products and services can be blocked according to location (geo-blocking).

Transaction Costs. Online business models have low transaction costs. They facilitate search for products and prices. Provision of further information assists decision-making (e.g. Tripadvisor). Payment is completed electronically. Customer service via offline channels increases transaction costs. Additional fees may increase transaction costs for online platforms (e.g. booking fees for intermediaries or indirect CRS fees for Lufthansa and AIG).

Information Symmetry & Trust Metrics. Models vary in terms of the amount of information provided to consumers to assist in search, evaluation and decision-making. Infomediary platforms such as Tripadvisor provide vast amounts of information on products, prices and consumer reviews/trust ratings. This reduces information asymmetry, decreases risk and increases consumer trust. OTAs and price-comparison sites also typically link to trust metrics. However, OTAs may use advanced online persuasion tactics in listings, including how many people are looking at a room, rooms left available, price availability, percentage discount, and so on. Some regulators have suggested that the information provided can be inaccurate or misleading, amounting to pressure selling, which therefore requires investigation²⁶, e.g. discount claims could be unfair and based on brief price or higher weekend rate. Search ranking results may also be influenced by commission, not value to consumer, e.g. on Booking.com. Direct sales and TTAs are more limited in terms of trust metrics due to their product focus, but they tend to have greater brand trust.

Pricing Mechanisms. Many OTAs offer the prevailing price due to price parity agreements with providers. This helps to prevent consumers searching for products and prices on an OTA and then purchasing them directly. Pricing algorithms tend to be very advanced, often based on yield management techniques. In some Member countries, prices/products offered by platforms are geo-blocked to protect revenues.

Network Effects. The larger the number of customers or suppliers, the larger the network effects; suppliers want access to a larger number of customers, while customers want access to many suppliers, products, and favourable prices. Online intermediaries such as Booking.com and Expedia have extremely large network effects and play a key role in driving up demand for hotels and flights.

Revenue Streams. The business models vary in terms of dominant revenue source. These include direct sales of own product, commission sales, mark-up sales, and advertising.

Cost Structure and Resources. Direct sales and TTAs have higher fixed costs, more assets and labour, and limited scalability.

²⁵ Barnes, S. and Hunt, B., eds. (2001). *E-Commerce and V-Business: Business Models for Global Success*. Oxford: Butterworth-Heinemann.

²⁶ Competition and Markets Authority (2017). CMA launches consumer law investigation into hotel booking sites. 27th October. <https://www.gov.uk/government/news/cma-launches-consumer-law-investigation-into-hotel-booking-sites>

OTAs and price-comparison sites have lower fixed costs, less labour and physical assets, benefit from size economies, and are more scalable, although spend on technology, marketing and innovation is extremely high to maintain their leading status. Large global intermediaries such as Priceline and Expedia employ aggressive tax planning and avoidance schemes and enjoy favourable tax conditions within certain Member States. This has led to recent attempts to close tax loopholes and reclaim tax, e.g. France sought €356m in back tax from Booking.com for the period 2003-2012²⁷.

Key Partners. Key partners for intermediaries are the suppliers of travel services, including airlines and hotels. Advertisers and technology providers are also extremely important for online intermediaries. For provider companies the focus is more typically on the traditional supply chain. Recently, OTAs have started to provide assistance for hoteliers through free data analytics platforms such as Expedia Rev+ and Booking.com Analytics.

Customers & Relationship Management. Whilst some online intermediaries might be considered to be more focused on short-term transactional elements, direct sellers and TTAs have tended to focus more on building customer loyalty. Online platforms are increasingly collecting large amounts of customer data in order to better understand their customers using big data analytics, particularly with the aim of segmenting, profiling and personalisation, including ascertaining willingness to pay, in order to maximise profit and capture consumer surplus. Even without detailed information, OTAs may employ price steering, e.g., offering more expensive options to consumers first.

2.7. Selected Issues for Regulatory Scrutiny

The booking fees introduced by Lufthansa and IAG for other platforms other than their own CRS are unlikely to be lawful. This represents discrimination against online and traditional intermediaries and appears to run against Regulation EC 80/2009 of the Code of Conduct for Computerised Reservation Systems.

Big data analytics and other technologies provide additional modes of discrimination, which are likely to develop further in the future. Customer relationship management (CRM) systems allow increasing levels of personalisation and intimacy with consumers. This is particularly the case where consumers are identified in online systems (e.g., through registration), but can also be facilitated for consumers that might consider themselves unidentified (e.g., 'cookies', which are small packages of data relating to users and website interactions, can be collected on computers and used to build consumer profiles). CRM systems may be able to segment or profile consumers according to their willingness to pay, maximising profit and capturing consumer surplus. Whilst this is unlikely to be contrary to EU law regarding the pricing mechanism²⁸, this could potentially breach EU Law with regard to privacy and data protection if obligations regarding adequate informed consent, choice and controls are not fulfilled, especially with the impending introduction of GDPR.

Geo-blocking stops or discriminates against customers in certain locations from purchasing a product. This is clearly discriminatory and against the goals of the Digital Single Market. On the 20th of November 2017, regulation to end unjustified geo-blocking was agreed by the European Parliament the Council and the Commission, promising to end this practice²⁹.

²⁷ Lomas, U. (2016). *France Seeks EUR356m In Back Tax From Booking.com*.

https://www.tax-news.com/news/France_Seeks_EUR356m_In_Back_Tax_From_Bookingcom_71371.html

²⁸ Maggiolino, M. (2017). *Personalized Prices in European Competition Law*. *Bocconi Legal Studies Research Paper Series*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2984840

²⁹ European Commission (2017). *Digital Single Market Policies: Geo-blocking*. <https://ec.europa.eu/digital-single-market/en/policies/geoblocking>

3. NEW BUSINESS MODELS: COLLABORATIVE CONSUMPTION

KEY FINDINGS

New collaborative consumption platforms for accommodation services have rapidly captured sales in the short-term accommodation market. These platforms provide significant benefits for consumers, businesses and society. However, they also pose risks, including issues of negative externalities, privacy and data use, taxation, safety and liability, peer discrimination, fair pricing, and the quality of trust platforms. Regulation of the new platforms is patchy, inconsistent and in need of unified development and implementation.

Business models in the accommodation services sector are similar to those of airline travel services. In the direct sales category, hotels are dominant, such as Marriot and Hilton. However, we now have an additional business model: collaborative consumption business models such as Airbnb are now a significant player in the market. Airbnb has more than twice as many rooms and Marriott. Let us examine how these new business models work.

3.1. Collaborative Consumption Business Model

In the collaborative consumption business model, there are typically three parties in a transaction. A multisided digital platform, such as Airbnb or HomeAway, creates a market and grants access to customers desiring accommodation, and peer providers that are willing to supply it. A consumer evaluates available services and their ratings and reviews on the trust platform. The consumer requests a service through the digital platform, such as an app on a mobile phone. The request is shared with the asset provider who considers the request and makes an offer to provide the service. If the request is accepted, fees are paid – rental and service fees. The asset is provided on a temporary basis to the consumer. Rental fees are held for a short time and then given to the provider; the platform retains service fees. Finally, consumers and providers review and rate the transaction on the trust platform – which feeds into the decision-making process of other consumers.

3.2. Collaborative Consumption: Benefits in the Accommodation Sector

Collaborative consumption provides many notable benefits³⁰, including the following:

Employment and Income Opportunities. The collaborative economy generates new income and employment opportunities, generating revenue beyond traditional linear employment relationships, according to flexible arrangements³¹. This may increase the economic activity of individuals where traditional forms of employment are less suitable. A study of Paris in 2013 suggested Airbnb supported 1100 jobs in the city, whilst a study in the UK in 2014 found that Airbnb had created 11600 jobs³².

³⁰ Barnes, S.J., and Mattsson, J. (2016). Understanding Current and Future Issues in Collaborative Consumption: A Four-Stage Delphi Study. *Technological Forecasting and Social Change*, 104, pp. 200-211.

³¹ European Commission (2016b). *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions. A European Agenda for the Collaborative Economy*. Brussels: European Commission.

³² Airbnb (2015). Economic Impact. <https://www.airbnb.com/economic-impact>

Reduced Cost of Ownership / Services. For the customer, the services are typically less expensive than the traditional alternative, e.g. hotel (or property ownership). Evidence also suggests downward pressure on the price of hotel rooms³³.

Flexible Supply. The platforms represent flexible, rapidly scalable supply. For example, a study by the World Economic Forum and MIT using Airbnb data estimated that 48,000 active listings housed 85,000 of the 500,000 visitors to the Rio Olympics, many created in the run up to the Games. Housing these guests would have been equivalent to building 257 hotels³⁴.

Improved Asset Utilisation. Unused capacity of properties can be used more fully.

Better Customer Service. New platforms offer speed and convenience of transactions on mobile devices. Interactions between host and consumer are more social and personalised than traditional hotels, with individual messaging, individual meetings, and many forms of bespoke help. There is more opportunity for creating a memorable experience.

Efficient Allocation Mechanism. The allocation mechanism goes some way towards optimal allocation of goods according to preferences³⁵. Information provision and trust platform metrics reduce information asymmetry and transaction costs; consumers can choose products that exactly meet their needs. Feedback is used to adjust price and supply.

Reduced Environmental Impact. More research is needed into environmental impacts. A study by Airbnb suggested that home sharing guests consume 63-78% less energy, 12-48% less water and generated 61-89% less Greenhouse Gas emissions³⁶.

Economic Growth. The sharing economy is predicted to grow substantially in the foreseeable future, with a compound annual growth rate of around 35% until 2015³⁷. This represents a significant engine of growth to slow growing economies – estimated to be ten times that of the broader rate of growth of EU economies.

Market Innovation and Competition. New business models promote healthy innovation, competition and economic renewal versus incumbent business models. They foster entrepreneurship³⁸, both in the development of new platforms, and the delivery of services via the platforms, e.g. a professional business run on Airbnb.

3.3. Collaborative Consumption: Issues for Regulatory Scrutiny

New collaborative business models create a number of issues worthy of regulatory scrutiny. Let us consider a number of these.

Data Privacy and Use. Sensitive personal data is collected and may be used for targeted marketing, both for existing and for developing new services. Often this data is collected without the knowledge of the consumer, and in some cases, it may be combined with other data sources to build a more accurate profile of the consumer. Many collaborative consumption companies operate globally, often headquartered in the US. The introduction of the GDPR on 25 May 2018 provides harmonisation of data protection within the EU, user controls over personal identifying data, and stricter control of data transfer outside the EU.

³³ Zervas, G., Proserpio, D., and Byers, J. (2014). *The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry*. School of Management Research Paper. Boston: Boston University.

³⁴ World Economic Forum (2016). *Understanding the Sharing Economy*. Geneva: World Economic Forum.

³⁵ Demary, V., and Engels, B. (2016). *Collaborative Business Models and Efficiency: Potential Efficiency Gains in the European Union*. Brussels: European Commission.

³⁶ Airbnb (2014b). Environmental Impact of Homesharing. <http://blog.airbnb.com/environmental-impact-of-homesharing>

³⁷ PwC (2016). *Op. cit.*

³⁸ Benoit, S., Baker, T.S., Bolton, R.N., Gruber, T., and Kandampully, J. (2017). A Triadic Framework for Collaborative Consumption: Motives, Activities and resources & capabilities of actors. *Journal of Business Research*, 79, pp. 219-227.

It is clear that many platforms currently do not conform to this standard and that work will need to be done policing the new regulations.

Peer Discrimination. Names and photographs can increase trust but also lead to gender and race discrimination. A study by Edelman et al. at Harvard found that renters with African-American sounding names were 16% less likely to be accepted by hosts on Airbnb and received 12% less monies for rental accommodation³⁹. Guests can have reservations suddenly cancelled without warning⁴⁰. Insufficient regulations exist to protect disfavoured groups in the sharing economy, e.g. racial minorities and low-income users⁴¹.

Information Asymmetry. The evidence suggests systematic bias in the ratings and reviews of customers on some platforms, which means that the information provided to other potential customers is biased and unrepresentative⁴². Evidence suggests that overall Airbnb ratings are too high and unreflective of the true quality of accommodation. One explanation for this is the notion of 'guilt-tipping'⁴³, due to the personal and social connection developed with a provider. Algorithms for recommendation can reflect the bias of reviews.

Safety and Liability. Airbnb has safety recommendations but does not inspect properties⁴⁴. Private kitchens are not licensed or subject to health and safety standards⁴⁵. There have been numerous anecdotal examples of the consequences of patchy safety and liability standards on Airbnb, including a guest who died of CO poisoning and a property that was wrecked by guests⁴⁶. Airbnb guarantees to pay for damages up to a certain amount, but this is not insurance and is subject to neutral arbitration⁴⁷.

Negative Externalities in a Locality. Evidence has shown that Airbnb rentals are more attractive to property owners than long-term rentals⁴⁸. This has led to a reduction of housing supply and increase in prices⁴⁹⁵⁰ in some areas, particularly some of the most expensive areas⁵¹. This can also lead to a sense of estrangement and unease for permanent residents in a locality as the nature of residents changes⁵², e.g. tourists tend to be noisier and may compete for public resources such as parking⁵³.

Pricing Mechanisms. Since the intermediary platforms are digital, they include algorithms for pricing.

³⁹ Edelman, B.G., Luca, M.S.D. (2016) and Svirsky, D.. Racial Discrimination in the Sharing Economy: Evidence from a Field Experiment. *Harvard Business School NOM Unit Working Paper No. 16-069*. <https://doi.org/10.2139/ssrn.2701902>

⁴⁰ Ranchordas, S. (2015). Does Sharing Mean Caring? Regulating Innovation in the Sharing Economy. *Minnesota Journal of Law, Science and Technology*, 16(1), pp. 413-475.

⁴¹ Codagnone, C., Biagi, F., and Abadie, F. (2016). *The Passions and the Interests: Unpacking the 'Sharing Economy'*. Brussels: European Commission.

⁴² Edelman, B.G., and Geradin, D. (2016). Efficiencies and Regulatory Shortcuts: How Should We Regulate Companies Like Airbnb And Uber? *Stanford Technology Law Review*, 19(2), pp. 293-328.

⁴³ Plangger, K. Personal Communication, King's College London.

⁴⁴ Yaraghi, N., and Ravi, S. (2017). *The Current and Future State of the Sharing Economy*. New Delhi: Brookings India.

⁴⁵ Ranchordas (2015). *Op. cit.*

⁴⁶ Yaraghi, N., and Ravi, S. (2017). *Op. cit.*

⁴⁷ Munkøe, M.M. (2017). Regulating the European Sharing Economy: State of Play and Challenges. *Intereconomics*, pp. 38-44.

⁴⁸ Demary and Engels (2016). *Op. cit.*

⁴⁹ Sheppard, S. and Udell, A. (2016). *Do Airbnb Properties Affect House Prices?* Working Paper. Williamstown: Williams College.

⁵⁰ Lee, D. (2016). How Airbnb Short-Term Rentals Exacerbate Los Angeles's Affordable Housing Crisis: Analysis and Policy Recommendations. *Harvard Law & Policy Review*, 10, pp. 229-253.

⁵¹ Wachmuth, D., and Weisler, A. (2017). *Airbnb and the Rent Gap: Gentrification through the Sharing Economy*. Working Paper. School of Urban Planning, McGill University.

⁵² Munkøe, M.M. (2017). *Op. cit.*

⁵³ Demary and Engels (2016). *Op. cit.*

Optimal pricing algorithms can earn considerable profit for platforms: for example, it is estimated that Uber's consumer surplus in the US is worth \$6.8 billion⁵⁴. Ancillary service providers such as Smarthost and Airdata use algorithms to determine profit-maximising prices for Airbnb hosts.

Professional Status. EU legislation does not establish expressly at which point a peer providing occasional services becomes a professional services provider⁵⁵. Different member states have different criteria, e.g. using thresholds of income and regularity. Below designated thresholds, e.g. 90 days a year or £1000 income, there may be possible exemptions from authorisation or tax⁵⁶.

Taxation. Income from sharing services should be declared and taxed in a similar way to comparable services. However, in reality it is likely that large amounts of income from collaborative platforms is not declared and taxed⁵⁷. Further, in some cases visitors may avoid tourism taxes and VAT. Platforms have been accused of aggressive tax planning and avoidance schemes⁵⁸, and this is facilitated by different tax arrangements among Member States, and insufficient information exchange⁵⁹.

Antitrust. It is possible that, in time, market dominance will become manifested in one or two large players. As multi-sided platforms become larger, they benefit significantly from network benefits. Platforms may develop lock-in and switching costs, e.g., for rebuilding trust on a new trust platform⁶⁰. As platforms become bigger, their power and large networks can potentially be used to move into new markets, e.g. Airbnb experiences and restaurants.

3.4. Regulatory Approaches to Airbnb within Europe

Regulatory approaches to Airbnb within Europe have been rather patchy, fragmented and in some cases have appeared to smack of protectionism. In the UK, short-term lets have been deregulated. Peers receive a sharing economy tax break of £1000 and a 'rent-a-room' tax break of £7500. In France and the Netherlands, tourist tax is collected through the platform. Further, in France an automated tax system over a certain threshold level has been suggested. In Germany, Berlin has banned unregistered short term accommodation rental without local authority permission. Similarly, in Belgium, the rental of accommodation on peer-to-peer platforms requires permission from local authorities and co-owners of buildings. In Spain, peer-to-peer rentals are regulated at regional level, e.g. Catalonia, where there is a cap of availability of short-term lets and compulsory VAT registration.

⁵⁴ Worstall, T. (2016). Freakonomics' Steven Levitt on How Inefficient Uber Really Is. Forbes, September 20th, p. 1.

⁵⁵ European Commission (2016b). *Op. cit.*

⁵⁶ European Commission (2016b). *Op. cit.*

⁵⁷ Munkøe, M.M. (2017). *Op. cit.*

⁵⁸ European Commission (2016b). *Op. cit.*

⁵⁹ European Commission (2016b). *Op. cit.*

⁶⁰ Demary, V. (2015). Competition in the Sharing Economy. IW Policy Paper, 19(July).
<https://www.econstor.eu/handle/1049/112778>

4. INFORMING POLICY: DATA-DRIVEN SOLUTIONS

KEY FINDINGS

Digital platforms have key advantages based upon technology, algorithms and big data analytics. The same components provide an important potential means for oversight and regulation of these platforms. This could allow for a soft-touch, automatic, dynamic and individualised approach to regulating services.

Data and algorithms create the basis for some of the problems of the new platforms, but by the same token, with creative legislation, they provide the tool to solve some of these problems. In order not to restrict the successful growth and benefits of the new business models and to reduce the regulatory burden on the European Commission, regulatory solutions should be soft-touch, automatic, individualised, and dynamic. Big data analytics provides a potential tool to enable such advanced regulatory solutions.

Tax Conformity. Issues regarding conformity to tax regimes can potentially be assessed by the automatic submission of financial data from peer users in the EU, as has been suggested by the French Government. In many cases, small volumes of activity will be exempt from income tax (e.g., less than £1000 annually in the UK) and data will not require submission. For professional users, identifying data (e.g. VAT number) should allow linkage between the different assets offered on platforms. Note that Article 15(1) of the e-Commerce Directive exempts platforms from monitoring or actively seeking illegal behaviour. The application of big data analytics to the collected data could assess the degree of conformity of platforms to local corporate tax regimes and flag efforts to offshore the tax burden.

Peer Discrimination. Data Analytics on sales and activity data from platforms can serve many other purposes. EU law prevents discrimination on the basis of age, ethnicity, religion, and so on. Analytics can determine if there is a systematic bias that requires regulation, such as low rents for homes owned by ethnic minorities. One possible soft-touch solution is to indirectly influence consumers to nudge them away from discriminatory behaviour, through indirect suggestions and positive reinforcement. This may include removing sensitive information or making it less prominent⁶¹.

Review and Rating Asymmetry. The Communication on Online Platforms and the Digital Single Market states that responsible behaviour in tackling fake or misleading reviews is encouraged. However, this encouragement does not appear to be effective. One way to attempt to remove the apparent bias is to detach the review process from a particular platform and provide an independent trust platform for EU citizens, where reviews can then be provided and linked to many platforms. Such reviews should be rated/validated by others. This could provide a central place for peers to establish their identity and credentials for trust, and build a trust score and trust credits (e.g. by writing fair reviews – a gamification or nudge technique). A separate trust platform would also remove associated switching costs, as mentioned above.

Data Privacy and Use. Compliant, transparent policy should be clearly specified on platforms, mentally processed by consumers, and options selected by consumers in a meaningful way.

In the sections of websites containing a consumer's personal account information, there could be check boxes to allow the consumer to opt-in/opt-out of certain identifying information and types of information sharing and data processing. The default should be opt-out.

⁶¹ Yaraghi, N., and Ravi, S. (2017). *Op. cit.*

Negative/Positive Externalities. Data could routinely be used to ascertain the negative impact of business models in terms of negative externalities.

Data from platforms can be combined with external data to assess deleterious impacts, e.g. impact on price and availability of local housing for residents. This can then be used as a basis for more precisely developing effective policy and regulation. One of my own pieces of research involved conducting data analytics to examine the introduction of Didi Chuxing, the ride-hailing service platform in China (51 cities in 2015) on car sales; the study found that it increased car sales (particularly for small cars) by more than 20%, strongly linked to city GDP and phone ownership. This unexpected effect is due to the low base of car ownership in China, and the need to purchase cars to provide the service. We expect this spike in car sales to lead to increases in pollution in Chinese cities – some of the most polluted cities in the world.

Unfair pricing. In order to determine the fairness of pricing algorithms, where a case has been made against them, they could potentially be submitted for technical audit. Auditing the algorithms through a process of simulation can determine the impact of the algorithms on consumer welfare and fairness. However, given that platforms may suggest that these algorithms are part of their competitive advantage, this process will most likely need to be confidential and in practice is likely to be heavily resisted.

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NOTES

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