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An analysis of the disruptive impact of the entry of Free Mobile into the French mobile telecommunications market

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Abstract

The issue of disruptive operators has recently gained interest among researchers and regulators. From a regulator's perspective, disruptive operators can increase competitive rivalry in markets dominated by a handful of large companies, thereby allowing consumers to obtain more benefits in terms of price and quality. Largely overlooked in this discussion has been the impact that the specific identity, complementary assets of operators, and their strategies have on the marketplace dynamics. In this paper we explore the impact that one such operator – Free Mobile – has had on the French mobile telecommunications market. Drawing on a wide range of secondary sources, our analysis finds that the entry and subsequent growth of Free Mobile has had a complex and multi-faceted impact on the market. Their growth has been at the expense of the other three mobile network operators active in the French market, while their innovative business model, which enables it to compete on the basis of low costs, has been copied by its rivals. The specific characteristics of Free Mobile and of its strategy have contributed to a significantly alteration to how competition occurs in this market. This, in turn, triggers a strong incentive for restructuring, which is actually restrained by regulatory concerns.

Keywords: Free Mobile, France, mobile telecommunications, disruption, entry, competition

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1. Introduction

The issue of disruptive operators has recently gained interest among researchers and regulators. From a regulator's perspective, disruptive operators can increase competitive rivalry in markets dominated by a handful of large companies, allowing consumers to obtain more benefits in terms of price and quality. In 2016, Ofcom, the UK's telecommunications regulatory, published a cross-country economic study that analysed the impact on prices of the presence of disruptive operators, finding that where disruptive mobile operators are present prices are lower by the order of between 10.7% and 12.4% compared to countries where there are no disruptive operators (Ofcom, 2016). In a handful of EU markets, the licensing process enabled a disruptive mobile operator to enter the marketplace. The most significant disruptive operator is arguably CK Hutchison, which trades as '3' in Europe, and whose difficulties since the turn of the millennium illustrates the challenges that a late entrant faces to overcome the established market positions of its rivals (Curwen and Whalley, 2006, 2014). There are, however, other disruptive mobile operators across the EU (Ofcom, 2016). To complement existing studies on disruption, which are often quantitative in character or focus on a specific issue (Le Goff and Rojas, 2015; de Mesnard, 2011; Ofcom, 2016), our analysis focuses on one specific operator: Free Mobile. Free Mobile, which is a subsidiary of Iliad, a prominent actor within the French telecommunications market, has had a significant impact on the market through its innovative business model and swashbuckling and entrepreneurial leadership by Xavier Niel.

Contrary to the dominant theory on disruptive innovation (that is, Christensen, 1997; Christensen and Raynor 2003), we adopt an outcome-based perspective on disruption and take into account external as well as internal factors. With this in mind, the rest of this paper is divided into seven sections. In the first of these, an overview of the relevant literature is provided before the focus shifts towards the French mobile telecommunications market in Section 3. In Section 4, attention shifts to Iliad before the entry of Free Mobile into the market is outlined in Section 5. The impact of this entry is detailed in Section 6, with the interplay between the identified issues discussed in Section 7. Conclusions are drawn in the final section of the paper.

2. Literature

Mobile telecommunication is characterised by technological change. Since the industry began in the early 1980s, four successive generations of technology, which are known as 1G, 2G

etc., have been adopted (Curwen and Whalley, 2011, 2013) and fifth one is currently under development. Not only has the transition from one technological generation to the next benefited consumers through, for example, supporting a wider range of services as well as improving their quality, but it has also provided an opportunity for new companies to enter the market for the first time. While the liberalisation process saw an increase in the number of mobile operators present in markets as they were opened up to competition (Baldwin and Cave, 1999; Curwen, 1997, 2002), the use of licensing to increase the number of mobile operators is particularly associated with 3G (Curwen and Whalley, 2006). Within Europe the licensing of this generation of mobile technologies started just before the turn of the millennium, with many countries award one more licence than the number of existing 2G operators (Gruber, 2007).

Across Europe such an approach resulted in a large number of new entrants – Curwen and Whalley (2015) identify 46 new entrants into mobile telecommunications markets as a result of the 3G licensing process. However, many decided not to launch their services – at the end of 2014, 18 new entrants had failed to launch their services (Curwen and Whalley, 2015). Moreover, even when they did launch, they often attracted relatively few subscribers. These two developments reflect the presence of extensive first move advantages within the mobile telecommunications industry (Curwen and Whalley, 2006, Park, 2009). The use of the 3G licensing process to enter European mobile telecommunication markers is particularly associated with one company, namely, CK Hutchison. This company used 3G to enter six different European markets, attracting just under 20 million subscribers by the end of 2014 (Curwen and Whalley, 2015). This 'success', however, has taken more than a decade to achieve and has only been possible due to the patience of the parent company in Hong Kong and its massive financial support (Curwen and Whalley, 2014).

Not only does CK Hutchison illustrate the scale of the challenge that any new entrant faces (Curwen and Whalley, 2006 and 2015; Whalley and Curwen, 2012), but it also demonstrates the impact that an entrant has on the wider telecommunications market. In those markets where it is present it sought to attract subscribers by competing on price, a strategy that ultimately forced its rivals in these markets to respond (Ofcom, 2016). More broadly, OECD (2015) found that more operators in a market was associated with enhanced innovative activity that results in all companies in a market improving their services with regards to price, quality etc. CK Hutchison is arguably an example of a 'disruptive' company whose presence is, according to Ofcom (2016), welcomed by regulators due to their positive impact

on the market. Notably, in addition to observing that the presence of a disruptive mobile operator reduces prices, Ofcom (2016) also demonstrated that their impact was magnified when there were more operators in the market. In other words, more operators, combined with the presence of a disruptive operator, maximises consumer welfare.

The pivotal role of prices and the number of operators can also be observed in Denmark. The proposed merger between Telia and Telenor in 2015 collapsed after the regulatory conditions imposed, which would have required the merged operator to divest assets to create a 'new' fourth operator, proved to be unacceptable (Curwen and Whalley, 2016; European Commission, 2015a, 2015b). Underpinning the remedies imposed on the merger by the European Union (EU) was the desire to maintain competitive pressures, an issue that was integral to the EU's opposition to the merger between O_2 Telefónica and 3 UK in the United Kingdom in the following year (European Commission, 2016).

Late entrants to mobile telecommunication markets often act as 'disruptors', encouraged to challenge the other operators in the market in order to attract subscribers and generate revenues. Ofcom (2016) argues that while there is no precise definition of 'disruption' it is possible to identify three broad categories of behaviour that a company may display. It may introduce a product or service that supersedes existing ones, or produce an existing product or services differently using new technologies (Ofcom, 2016: 4). The company can also show 'aggressive behaviour', such as competing aggressively and prioritising gains in market share over profitability.

While CK Hutchison is a disruptive operator, who else may fall into this category? Ofcom (2016) identifies several other disruptive operators across Europe – DNA in Finland, Play in Poland, Yoigo in Span and Free Mobile in France. Given the potential impact that these mobile operators may have on their respective national markets, surprisingly little research has sought to understand their strategies. The specific identity and previous (complementary) assets have also been overlooked. To address this oversight in the literature, this paper focuses on one of these disruptive companies: Free Mobile. When Free Mobile is discussed in the literature, it is usually in the context of a quantitative study (see, for example, Elixmann, Godlovitch, Henseler-Unger, Schwab and Stumpf, 2015; Houngbonon, 2015). As such, a detailed understanding of the strategies that it has adopted does not emerge as the focus is on the outcome and not the strategic choices made by the operator. Moreover, the analysis often focuses on specific issues like pricing (Houngbonon, 2015) or investment

(Elixmann, Godlovitch, Henseler-Unger, Schwab and Stumpf, 2015) with the consequence that the specific strategies adopted are overshadowed.

In contrast are papers that have examined the French market in more detail. The impact of Free's entry is explored by de Mesnard (2011) through the use of a stylised model of the French mobile telecommunications market, and while informative this analysis is theoretical in character – the modelling does not include data pertaining to the French market, but instead is based on a series of assumptions and propositions informed by theory. Le Goff and Rojas (2015) investigate the commoditisation of products, highlighting how this is the result of a range of technological and regulatory factors combining together. While this analysis examines the impact of commoditisation on all four mobile operators, underplayed in their analysis is the role of Free Mobile in disrupting the market through exploiting technological change on the one hand and regulatory opportunities on the other.

Our aim is to take into account a broader scope of issues, by highlighting the dynamics resulting from the interaction between different factors and decisions during the years preceding and following the entry of Free Mobile. Therefore, this paper adopts a longitudinal case study approach (Gomm, Hammersley and Foster, 2000), drawing on a range of secondary data sources from the annual reports of operators, documents from the regulator and the trade press to explore the disruptive impact of Free Mobile on the French telecommunications market.

It should be noted that our approach differs from the mainstream disruption theory while also complementing it. For the main proponent of this theory, namely, Clayton Christensen, disruption is defined as a process with precise characteristics, through which a smaller competitor with limited resources is able to successfully challenge established incumbent businesses (that is, Christensen, 1997; Christensen and Raynor 2003). Despite its obvious merits, the definition by Christensen appears to be quite restrictive and may not be encompassing enough to account for every kind of disruptive behaviour. Christensen's theory also does not explicitly consider the influence of external factors such as country or industry characteristics, or internal (firm-specific) factors such as resources and competences. In this article, we adopt an outcome-based perspective by analysing a case in which a market has been effectively disrupted, and explicitly include in our approach the role of external factors. We also emphasis internal factors, and, in particular, the role of complementary assets owned by Iliad.

3. The French mobile telecommunications market

3.1 Before 3G

The first analogue cellular mobile service was introduced in France in 1986 by 'Direction Générale des Télécommunications', a monopoly provider that subsequently become France Télécom in 1988, under the name Radiocom 2000 (Vialle, 1998). The liberalisation of the market to competition quickly followed in 1987, when a second mobile operator - Société Française du Radiotelephone (SFR) - was awarded a license to also offer analogue mobile services (Vialle, 1998). Notwithstanding the liberalisation of the market, until the launch of digital services the penetration rate was low and services were expensive (Penard, 2001; Vialle, 1998), limited to business and affluent customers.

Following the adoption of GSM by the European Community in 1987 (Official Journal of the European Communities, 1987), France Télécom and SFR obtained licenses in 1991 in the 900 MHz range, and started to offer digital services from the following year (Vialle, 1998). However, the market was not very competitive, and the mobile penetration rate was low compared, especially when compared to the EU average (Penard, 2001). Therefore, a third licence was awarded to Bouygues Telecom in 1996. This new competitor mimicked the strategy of Orange in the UK, introducing cheap and easily understandable mobile plans – 'forfaits' - including an allowance of minutes and free voicemail, and targeted primarily young customers (Penard, 2001). The other mobile operators swiftly copied this strategy, launching their 'forfaits' in March 1997 (Penard, 2001). Prices declined and the market grew, as previously untapped market segments adopted mobile services (Penard, 2001).

The period until around the turn of the millennium also witnessed a struggle for market share between the now three mobile operators that was characterised by promotional offers (Penard, 2001). Significantly, the introduction of a third operator also spurred innovation – Bouygues Telecom was, for example, the first operator to introduce prepaid cards (1997), plans with free calls on weekend (1999), pricing per second (2002), i-mode (2002), as well as connected PCs (2003) (Bouygues Telecom, 2018).

However, by the early 2000s the French mobile operators were focusing not on gaining market share but instead on 'harvesting' their respective customer bases. In 2005, after an investigation started in August 2001 and a referral by UFC Que Choisir in February 2002 (Conseil de la concurrence, 2005; Le Monde, 2005), the French competition authority fined the three operators for engaging in two different kinds of anticompetitive behaviour that

distorted competition (Autorité de la concurrence, 2005). The first type of anticompetitive behaviour, which occurred between 1997 and 2003, related to an agreement to exchange each month basis information pertaining to subscriptions and cancellations, while the second was agreement between the three operators from 2000 to 2002 to stabilize their market shares based on jointly-defined targets (Autorité de la concurrence, 2005).[1] Collectively the fines amounted to €534 million – Orange France paid €256 million, SFR €220 million and Bouygues Télécom €58 million (Autorité de la concurrence, 2005).

It is also worth noting that while the three mobile operators were engaged in 'peaceful' competition, L'Autorité de Regulation des Telecoms (ART), the telecommunications regulatory, had adopted a somewhat negative view of mobile virtual network operators (MVNO). This is clearly demonstrated by the ruling in the dispute between Télé2 and Orange (ART, 2002), the consequence of which, when combined with the managed competition between the three operators, was to limit competitive pressures within the mobile telecommunications market.

3.2 The award of 3G and 4G licences

At the time of the call for tender in August 2000 the French government initially intended to award four 3G licences, each costing €4.95 billion (Jurispedia, 2009). Only France Télécom and SFR maintained an interest throughout the entire process and obtained a licence in September 2001 following a 'beauty contest' (Jurispedia, 2009). It was obviously not a satisfactory situation, particularly as the EU had mandated that the number of 3G licences should be higher than the number of GSM operators (Jurispedia, 2009). Therefore, an additional call was made for a third 3G licence on 29 December 2001 with considerably better conditions: the price was reduced to €619 million, with an annual charge of 1% of 3G revenues and the duration of the licence extended from 15 to 20 years (Jurispedia, 2009).

Despite these more advantageous conditions, only Bouygues Telecom submitted an application, with the lack of interest perhaps due to the harsher economic climate following the bursting of the Internet bubble. The licence was awarded on 12 December 2002. Shortly before, on 3 December, the same conditions had been granted to France Télécom and SFR so that no discrimination occurred between the three operators (Jurispedia, 2009). France Télécom and SFR were initially obliged to launch 3G services by June 2002 and Bouygues by

[1] The announcement by the Autorité de la concurrence draws attention to Orange, SFR and Bouygues drawing up handwritten documents agreeing to the "pacification of the market" and "Yalta of market shares" (Le Monde, 2005).

December 2004. However, due to a combination of technical, financial and operational concerns, ART allowed France Télécom and SFR to delay their 3G launch until 31 December 2004, and Bouygues Telecom until 30 April 2007.

In early March 2007, the telecommunications regulator announced a fourth 3G licence. Free Mobile, a subsidiary of Iliad S.A., which was already well known in France for triple-play services under the brand 'Free', was the only company to respond by the deadline of the end of July 2007. However, ARCEP, which had replaced ART in May 2005, rejected this proposal - it felt that Iliad/Free Mobile had failed to provide sufficient evidence of its financial resources, especially with regards to paying the fixed licence fee of €619 million (ARCEP, 2007). As a consequence, the award of a fourth 3G licence was put on hold. The topic came reappeared when Prime Minister François Fillon, via a press release, asked ARCEP to start the process culminating in the award of a fourth 3G licence (Premier Ministre, 2009).

The government proceeded by modifying their approach – the remaining 15 MHz was divided into three equal lots, with one reserved for a new entrant with a fee of €240 million (Hocepied and Held, 2011). The remaining two lots were auctioned in early 2010, with SFR bidding €300 million and Orange €282 million to acquire the available spectrum (Hocepied and Held, 2011).

Despite rumours of interest from companies such as Virgin Mobile or Numericable (Sanyas, 2009), Free Mobile was the only one to make a proposal prior to the deadline of 29 October 2009. After reviewing the application, ARCEP announced its decision to award Free Mobile the fourth UMTS licence on 17 December 2009 (ARCEP, 2009). The licence was subsequently issued on 12 January 2010. The terms of the licence also include the commitments made by Free Mobile in its application, with the following being particularly relevant:

- to offer consumers clear and innovative services at competitive prices;
- to host MVNO operators (including full MVNOs);
- to launch its services within two years (that is, by January 2012); and,
- to cover at least 90% of the population with its 3G network within eight years.

The award of 4G licences started before Free Mobile actually launched its mobile services in January 2012. On 22 September 2011, ARCEP awarded four licences, for duplex frequency blocks in the 2.6 GHz band, for a total of €936 million (ARCEP, 2011a). On 22

December 2011, ARCEP awarded a further three licences for duplex frequency blocks in the 800 MHz band (ARCEP, 2011b). The award of these three licences raised a total of €2,639 million. Free Mobile offered less than the other operators, and thus did not obtain a licence. On 24 November 2015, ARCEP finally awarded four licences for duplex frequency blocks in the 700 MHz band, raising €2,798 million in the process (ARCEP, 2015b).

ARCEP also made a range of decisions concerning the refarming for 4G of 1800 MHz bands initially used for GSM, with the general objective being establishing a spectral balance between the four mobile operators. After a period of transition, SFR, Orange and Bouygues Telecom were each allowed to use a block of 20MHz, and Free Mobile a block of 15 MHz from 25 May 2016 (Christian, 2015).

4. Iliad

4.1 Background

Iliad was founded in 1993 after his owner, Xavier Niel, bought a Videotex service provider specialising in the 'pink Minitel' (Godeluck and Paquette, 2016; Rabreau, 2014). In 1999 the company obtained telecommunications licences (called L. 33-1 and L. 34-1) to operate a network and market services to the public. It started operations under the brand 'Free', and it is by this name that the company is typically referred to. In 1999 it launched an attractive Internet access service without subscription and commitment, with the pricing being by minute without any additional charges (Ferret, 2014). This service was arguably quite innovative and was extensively marketed under the slogan "freedom is priceless". Following an investment of €15 million by Goldman Sachs, Free started to deploy its own network and interconnect it with France Télécom's network (Dauret, 2012). In 2001 Free extended its scope by buying One.tel from Centrica, and acquiring its licence for 10 years (Iliad, 2004).

In 2002 Free launched its unlimited broadband ADSL Internet access priced at €29.90 (Iliad, 2004), which was transformed in a triple-play offer in 2003 at the same price (Iliad, 2004; Ferret, 2014). The triple-play offer, which evolved quickly to include ADSL2 in 2004, included several IPTV channels as well as free telephone calls to fixed subscribers (Iliad, 2003; Ferret, 2014). This development provided a strong impetus to the French broadband market (Daidj and Vialle, 2011). The high level of competition and innovation resulted in strong growth, with Freebox leading the market with 300,000 installed by October 2006 (Iliad, 2006a, 2006b). The French market also became the largest IPTV market in Europe

(NPA Conseil, 2006, 2008). It is important to note that the successful entry of Free was facilitated by the French regulation, which mandated that the incumbent operator had to offer attractive interconnection, unbundling, and wholesale solutions to competitors (ARCEP, 2002).

In 2004 the company was floated on the French stock market, raising €118 million (Iliad, 2005), and valuing it at more than €1 billion (Les Echos, 2004). An important acquisition was made in 2008, when Iliad acquired Liberty Surf S.A., the Internet access subsidiary of Telecom Italia in France (Iliad, 2009a; Le Point, 2008). Operating under the brand Alice, the company brought around 850,000 subscribers to Iliad, allowing the company to reach a market share of 25.5% of the broadband Internet installed base across France (Iliad, 2008). By 2009, the year it gained its 3G licence, Iliad had total revenues of €1,954.5 million and a net income of €175.9 million (Iliad, 2010; Le Figaro, 2010).

It is important to stress the general characteristics of Iliad's business model for broadband Internet, as through doing so a better understanding of its business model for mobile business emerges. The broadband Internet business model of Free is characterised by a mix of low-cost and innovation strategies, as well as its ability to seize opportunities. As we have explained, the market success of Free was based on cheap, integrated and innovative offers as exemplified by its triple-play service. In order to keep costs low, Free operated exclusively on-line without physical shops, and with a minimal level of customer service. Other marketing expenses such as advertising were also limited, with the company relying initially more on noteworthy events and slogans, and on word-of-mouth through its very active 'community'. Free also progressively developed or acquired its infrastructure, and was able to do so relatively inexpensively by acquiring assets cheaply in the period after the dot.com bubble burst.[2] More recently, it has also invested in fibre-to-the-home/building (Axione, 2017; Iliad, 2009b, 2015, 2016a, 2017), with the objective of connecting nine million homes by 2018 and 20 million by 2022 (Chicheportiche, 2016).

With regards to technical innovation, Free relied on a mix of its own development and open innovation. It designed its own DSLAM and set-top box called 'Freebox' (Iliad, 2004; Ferret, 2014). This allowed Free to provide a multi-service box incorporating the newest technologies, and thus to often introduce significant innovation before its competitors were

[2] By 2011 Iliad was able to use 64,000 km of fibre optics including 31,800 km of dark fibre through indefeasible right of use contracts (Iliad, 2011a).

able to do so. The Freebox became a platform for various services: IP telephony, IPTV, VoD, personal TV, Games, applications, etc.

Although Free designed its own products, it also relied heavily on open source software such as the Linux operating system. Perhaps of greater significance, however, was the reliance of Free on its community of users via different forums such as Freenews, ADUF, Freeplayer.org or UniversFreebox.com. This facilitated not only for the creation of a communicative effect around its services, but it also compensated for its minimal level of customer service. It was often initially quicker (if not the only way) to find an answer in a forum, than trying to obtain help from customer service. More generally, by relying on open innovation and communities, Free was seen as a fashionable / trendy company in accordance with the 'free Internet' way where access to the Internet occurs without charge.

Finally, during its history Iliad/Free has been able to seize opportunities to develop its business. Not only have the regulatory opportunities offered by the liberalisation enabled it to enter the French telecommunications market, but also the economic opportunities resulting from the rise of the Internet and the bursting of the Internet bubble facilitated this entry. Iliad/Free has also been able to identify and then utilise societal changes, with the two most significant arguably being the rise of the 'free Internet' mindset and open innovation. Its entry in the cellular market further illustrates its ability to seize opportunities.

The decision by Xavier Niel to enter the mobile market suggests that he had identified that the telecommunications market was evolving towards fixed/mobile convergence or quad-play. From this perspective, it is doubtful that a fixed only company would be able to continue to prosper within the market. The only other alternatives would have, most likely, been to sell his broadband company or to merge it with a mobile operator and thus lose control of his business.

4.2 The pro and cons of a fourth 3G licence

The introduction of a fourth licence and its award to Free Mobile was a significant development within France. It highlighted two opposing rationales. One rationale, which was shared by ARCEP, the European Commission and the Prime Minister at the time of granting the licence, was that more competition would provide fresh benefits to consumers, especially when in terms of declining prices (European Commission, 2009b). The other rationale, supported by the three existing operators and the then president Sarkozy, was focused on industrial policy.

For the proponents of granting a fourth 3G licence, the French cellular market was suffering from a lack of competition. Unlike most European countries that had four or more mobile network operators, France was one of the few mature markets with only three mobile network operators with an incumbent controlling a large portion of the market (European Commission, 2009b). It was dominated by three operators following a policy of market share stabilisation since the beginning of the 2000s: by October 2008, France Télécom (now Orange) had a market share of 43.6%, significantly more than SFR (33.4%) and Bouygues Telecom (17.2%) (European Commission, 2009a).

As a result of this low level of competition, the cellular market was insufficiently developed and prices excessive. According to a report of the European Commission (European Commission, 2009c), the penetration rate of mobile services in France, at 88.4% as of October 2008, was well below the EU-27 average of 118.9%.[3] According to the European Commission, the introduction of a fourth mobile operator would not only increase competition and choice for consumers (European Commission, 2009b), but also allow MVNOs to benefit from increased negotiation opportunities. For ARCEP, the comparison with the fixed broadband market was enlightening: as of January 2009, broadband penetration rate in France stood at 27.7% ahead of the EU-27 average of 22.9% (European Commission, 2009b), but prices were also higher in France than in other countries (OECD, 2009).

For ARCEP and the French government, issuing a fourth licence would normalise France with respect to the number of mobile operators. This would, in turn, lower prices and trigger the subsequent development of the market as the operators compete against one another for market share. However, the three mobile operators tried to pressurise the government and heighten public concern, as they had much to fear from Free Mobile. They even received unexpected support from Nicolas Sarkozy who stated that he was "sceptical and reserved on the choice of a fourth mobile operator because the lowest price is not necessarily the best" (Les Echos, 2009).

The argument against issuing a fourth licence related to industrial policy. Martin Bouyges asked: "What guarantees do we have that this license will not primarily benefit the Asian manufacturers who receive massive aid from their governments?" (Champeau, 2009). Moreover, and quite dramatically, Martin Bouygues asserted that a 'social slaughter' would

[3] However, other factors may also explain these differences, such as, for example, the fact that the French market exhibited a higher share of contract (post-paid) subscriptions as opposed to pre-paid.

occur, with an estimated 10,000 to 30,000 jobs being lost due to the downward pressure on prices resulting from the introduction of a new entrant into the market (Champeau, 2009). The chairman of Vivendi, the parent company of SFR, went as far as declaring that a price war already existed in France and that the French were already benefitting from prices that were among the lowest in Europe (Champeau, 2009).

The three existing mobile operators also complained about unfair discrimination, as Free Mobile only paid €240 million while they paid €619 million for their licence. They filed complaints with the European Commission and the French State Council containing accusations of unfair pricing and also accused the authorities of indirectly granting state aid to the would-be new entrant (Hocepied and Held, 2011; Le Monde, 2010). The European Commission rejected the accusation, stating that it has been a transparent and open procedure that resulted in a competitive outcome (European Commission, 2011). The French State Council also noted that the price of €619 million paid by the incumbents for 15MHz band was commensurate with the price of €240 million for the 5MHz allocated to Free Mobile (Le Monde, 2010).

5. The launch of Free Mobile's services

According to the terms of its newly granted licence, Free Mobile was required to publish details of how its network could cover a quarter of the French population. In order to cover the remaining three-quarters, Free Mobile signed an agreement with Orange France on 2 March 2011 that included both voice and data (Iliad, 2011b). The contract came into force in late December 2011 (Zdnet, 2011). The revenue to be generated through this contract has been estimated to around €1 billion over six years, derived from a fixed sum and a variable fee dependent on volume (Les Echos, 2013).

On 10 January 2012, Free Mobile's owner Xavier Niel launched its product offering during a live presentation streamed from Iliad's headquarters. During this presentation he described the customers of incumbent operators as 'suckers' and demonstrated that Free Mobile's offering was twice as cheap than those from the other three mobile operators (Iliad, 2012a). Following the strategy adopted by Free for broadband services, the mobile packages were cheap, simple and integrative bundles, with only two packages available (La Tribune, 2013). The first package, which was €19.99, included unlimited calls to 40 countries, unlimited SMS and MMS, and 3 GB of data. A second 'social' package was also announced, including 60 minutes of calls and 60 SMS for only €2 per month (Iliad, 2012b; Freenews,

2012). Free Mobile also demonstrated its strategy of 'harvesting' its installed base of ADSL customers with special prices targeted towards them, that is, its existing broadband customers would pay €15.99 for the first package (Iliad, 2013) and nothing for the second 'social' package (La Tribune, 2013).

The two packages were also 'SIM only' with the consequence that no handset subsidy occurred (La Tribune, 2013). Furthermore, neither package was subject to contract duration obligations or a termination penalty. This echoed the company's slogan of 'freedom' and reflected the observation by Free Mobile that some customers felt constrained by both handsets customised by operators and contractual obligations. Finally, similarly to its broadband packages, Free Mobile sold solely online and did not establish any retail shops to distribute its products.

The launch of these two mobile packages generated substantial demand that unfortunately resulted in problems that appeared to be detrimental to Free Mobile. Firstly, the website of Free Mobile, the sole means through which it interacted with customers, was soon overwhelmed – customers could not place their orders, the despatch of SIM cards to customers was delayed and customers experienced long delays when trying to contact the company's customer services (La Tribune, 2012). Secondly, GIE EGP, the organisation managing mobile number portability, was unable to cope with the massive demands being placed on it by Free Mobile. To manage this situation, Free Mobile voluntarily limited the number of number portability requests to 40,000 a day (La Tribune, 2012). Thirdly, Orange's network, which Free Mobile was using, began to suffer congestion related problems due to the amount of voice and data traffic being generated by Free Mobile's customers (La Tribune, 2012). This adversely affected the quality of service experienced by customers of both Orange and Free Mobile. This negative impact is unsurprising given the rumour that Free Mobile managed to attract 2 million customers within a month of launching its services (French Web, 2012).

Only three days after the launch of Free Mobile's services, the other three mobile operators and MVNOs reacted with new service packages of their own. The mobile operators created sub-brands offering similar unlimited packages, but with specific constraints in order to avoid the cannibalization of their own (traditional) plans (La Tribune, 2012).[4] The constraints are similar to those imposed by Free Mobile, namely, online only transactions and

[4] These sub-brands were created in the third and fourth quarters of 2011, but were not truly 'activated' until just before the launch of Free Mobile's services.

no handset subsidy (La Tribune, 2012). Orange and SFR proposed packages with unlimited voice telephony, SMS and MMS, but only 1 GB of data (against 3 GB for Free Mobile). Only Bouygues Telecom, the operator with the lowest market share, and Virgin Mobile, a major MVNO, launched packages that were exactly the same as Free Mobile (Nouvelobs, 2012).

Free Mobile's packages have not significantly changed since the first year of their launch, except, that is, to take into account the launch of 4G services. The other three mobile operators invested heavily in their 4G networks (Le Monde, 2013), and were hoping that this would facilitate their differentiation and, through this, improvements in their margins due to higher (premium) pricing (Le Monde, 2013). Unfortunately, Free Mobile decided to launch at the start of December 2013 a 4G version of its package at the same price as 3G (Le Monde, 2013). Moreover, the 'fair use' data allowance was extended from 3 GB for 3G to 20 GB for 4G (Le Monde, 2013). It is, however, worth noting that when Free Mobile launched its 4G packages there was significant uncertainty regarding how extensive its 4G geographical coverage actually was (Le Monde, 2013).

It is arguably the case that Free Mobile would not have been able to offer such low prices and market its services so easily without the presence of extensive synergies with Free's broadband operations. While the wireless infrastructure represented an additional investment for Iliad, Free Mobile could use the same core network as the broadband operations as well as the same interconnection facilities with other operators (L'express L' expansion, 2012). Secondly, a significant proportion of the company's customers are subscribers to both broadband and voice services, thereby allowing for traffic substitution between the two services. Both the broadband and mobile packages offer unlimited voice calls, but as calls from the home are substitutable it is most likely that users place mobile instead of fixed calls at home. Furthermore, it is also reasonably likely that a significant share of users switch from 3G/4G to WiFi when at home. A third source of synergy emanates from Free Mobile's decision to focus its marketing efforts on Free's installed base of broadband subscribers by offering them discounted tariffs.

While the approach followed by Iliad in the mobile market shared some common characteristics with the one implemented in the broadband market, some notable differences can also be identified. In the broadband market, Free was able to blend technological and business model innovation by developing its own set-top box (Freebox) and introducing IPTV. It has been possible because the market was not mature and there was still room to innovate. In contrast, the mobile market did not offer such opportunities as the technological

system was mature and dominated by a handful of powerful global companies. Therefore, the mobile approach was, as described above, mainly based on low prices and synergies with Iliad's previous assets.

6. The impact of Free Mobile

As alluded to in previous sections, the entry of Free Mobile into the French market sent a shock wave across the tightly knit world of the other three mobile operators. The initial impact appeared positive, with the price to quality ratio of the Free Mobile packages being favourable and Xavier Niel, the CEO of Iliad, stating his ambition to control a quarter of the market "in a few years" (Belouzzane and Ducourtieux, 2012). Not only would this necessitate an immediate response from the other operators, but would have an impact in the medium to long term as well. With this in mind, the following sub-sections explores the impact of Free Mobile's entry into the mobile telecommunications market from a variety of perspectives. While it is not always possible to attribute changes in the French mobile telecommunications market solely to the entry of Free mobile, it is possible to note a strong correlation between this entry and the variables we study in this article.

6.1 On customers and profitability

Free Mobile was able to grab a large market share very rapidly. Nearly one year after it has launched, Free Mobile has 5 million subscribers, a number that would double in three years. Although the growth rate of Free Mobile's customer base has subsequently slowed markedly, it has remained positive since services were launched. In contrast, Free Mobile's competitors immediately lost customers in the first quarter of 2012 but have since managed more or less to stabilise their market share through a combination of price reductions and M2M products, in particular via the launch of low-cost brands by the incumbent operators. The performance is rather erratic for SFR, which deployed different strategies at various times while Bouygues Telecom only managed to recover at the end of 2014. Free Mobile did not gain customers from one of its rivals in particular, but instead took a little bit from each of its competitors, MVNOs included. MVNOs had a particularly hard time trying to compete against Free Mobile. The competitive advantage of most of them was low prices and these were squeezed through a combination of the (low) Free Mobile retail prices and the wholesale prices paid by the MVNO to the operator hosting their traffic. Indeed, the largest MVNO, Virgin Mobile, was sold to Altice in 2014 (Godeluck, 2014).

The profitability of the French mobile operators is not easily determined due to how they publish their financial results. All four of the mobile operators have at least two lines of business, and do not always provide the necessary detail needed to determine the profitability of a specific line of business. Having said this, from the available information it is possible to make the following two observations. Firstly, notwithstanding its low prices, Free Mobile has managed to maintain a relatively high level of profitability with the exception of 2012 when its net income declined 26 per cent compared to the previous year. Free benefited from spreading its capital expenditure over time due to its roaming agreement with Orange France. Secondly, the other three operators – Orange, SFR and Bouygues – all witnessed their profits decline, with some even experiencing losses. Bouygues Telecom in particular has lost a substantial amount of money since 2012.

More broadly, we can say that mobile average revenue per user (ARPU) has consistently declined over the period 2012 to 2016 (inclusive). While Free Mobile does not publish details of its ARPU, it is possible to calculate them using the figures that are available – Free Mobile's ARPU per month is typically around €14, a figure that is not only declining but considerably below the €20 of its rivals. That the ARPU of Free Mobile is below its rivals reflects the existence of a low-cost offer (which is just €2 per month) as well as the low prices charged for combined mobile and broadband packages. The continued and robust profitability of Iliad appear to be all the more remarkable due to the modest level of income its derives from its mobile operations and is arguably underpinned by the company's usual (and low) cost structure.

Mobile telecommunication revenues have declined every quarter since Free Mobile was launched until the end of 2017, though the rate at which this decline has occurring has slowed. As the revenues of Free Mobile have increased, from €1,261 million in 2013, its first full year of operation, to more than €2 billion in 2016 (Iliad, 2014, 2017), it is likely that the revenues of the other mobile operators have fallen considerably. The continued profitability of Iliad stands in stark contrast with that of Bouygues Telecom, as shown in Figure 1.

[Insert Figure 1 about here]

6.2 On prices

Mobile telecommunications prices are difficult to track due to the multiplicity of complex and evolving tariff plans. In this respect the French methodology uses a customer profile-based method (ARCEP, 2016c). INSEE, the French national statistical office, has noted a significant

fall of telecommunications prices: -3.3% in November 2012, and -15.1% between November 2011 and November 2012 (INSEE, 2012).[5] Moreover, the initial set of price data for mobile services published by ARCEP since the launch of Free Mobile on the market found that prices dropped by 11.4% in 2012 (ARCEP, 2013). Such a decline is not a surprise when it is remembered that Free declared as far back as 2008 that it would halve the price of mobile services within France – and this is something that more or less occurred between 2012 and 2015 (Le Figaro, 2008). As the weight of mobile services in the French consumer price index peaked at 1.58% in 2010 before declining to 1.1% in 2016, the decline in prices is stronger than the increase in use that has occurred.[6] Using a hedonic pricing model, Nicolle, Grzybowski and Zulehner (2018) estimate that the entry of Free Mobile and low-cost brands can explain 23.4 % of the mobile price decline between May 2011 and December 2014, while 56.1% of the price decline can be attributed to the introduction of 4G. The impact of competition appears to be lower on 'classic' tariffs than on low-cost tariffs. However, prices are not the only variable to be considered: Bourreau, Sun and Verboven (2018: 33) show that for French consumers welfare increased mainly through "the increased variety offered by the new entrant and through the incumbents' fighting brands [...] and much less by the intensified price competition".

[Insert Figure 2 about here]

6.3 On employment

The long-term trend employment trend is negative but low-cost strategies usually mean employing even fewer people. The three existing mobile operators all had fairly large manpower: in 2012, the total (fixed and mobile) employed amounted to around 100,000 employees at Orange France, 10,000 at SFR and 9,000 at Bouygues Telecom. In contrast, Free employed 'just' 5,000 employees. In 2002 Iliad reported that its entry into the mobile telecommunications market would create 2,000 jobs (Godeluck, 2012),[7] a figure completely overshadowed by the 30,000 who are expected to retire from Orange France between 2014 and 2020 (Renault, 2012). This downsizing would enable Orange France to reduce its cost

[5] Moreover, the French telecom price index computed by INSEE abruptly fell from 159.62 in March 2011 to an all-time low of 94.09 in April 2013 – that is, it declined by 41% in just two years (INSEE, 2012).
[6] For the evolution of communication volumes see, for example, ARCEP (2016b).
[7] However, Free created just 1,000 jobs in 2012 (Renault, 2013).

base and thus become more competitive, something that would not be available to either SFR or Bouygues Telecom with their younger workforces.[8]

The impact of Free's entry on employment within the sector has not been without controversy. In 2012 the economist Bruno Deffains argued that Free, destabilizing the incumbents, would destroy around 55,000 jobs out of the 129,000 employed by French telecommunication operators (Deffains, 2012). In contrast, two other French economists - Augustin Landier and David Thesmar - explained that lower mobile tariffs, first because of Free then by contagion to the other operators, had 'given back' €1.7 billion to the users of mobile telecommunication services (Landier and Thesmar, 2012). This would, in turn, generate economic growth and thus create somewhere between 16,000 to 30,000 jobs in other sectors.

According to ARCEP, the telecommunications services industry has lost around 10,000 jobs between 2012 and 2015 – but the final job reduction could much higher as it is continuing. When Altice, the parent company of Numericable, acquired SFR in 2014 it promised not to cut jobs before 2017, but the economic challenges facing the company in 2016 were of such a magnitude that it decided to begin to reduce its headcount earlier than planned. Of the existing 14,300 jobs at SFR, 1,000 jobs could disappear in the retail operations of the company and another 4,000 in the core set of SFR activities.

[Insert Table 1 about here]

Beyond the three older mobile operators, job losses have been widespread in the smaller firms like MVNOs, call centres and in the mobile distribution network within France. The largest firm closing down was The Phone House, whose 230 retail stores closed down in 2013 (The Connexion, 2013). The three mobile operators had used The Phone House as an additional complementary distribution channel, but when they restructured their own operations they found that their own stores were sufficient for the higher (premium) end of the market while the other customers went online (Bonora and Dor, 2013). As a result, they discontinued their agreement with The Phone House.

[Insert Figure 3 about here]

[8] Determining the exact age profile of the mobile operators is challenging due to how they present their employment data. Having said this, examining various documents from Orange reveals that more than half of its workforce was aged 50 or more at the end of 2012 while a fifth of SFR's workforce was aged 55 and above. In contrast, just over 10 per cent of Bouygues Telecom's workforce was aged 45 and above.

6.4 On investment

It is widely accepted that infrastructure-based competition requires investment in networks. Prior to launching its various services in 2012, Free Mobile invested around €1.5 billion and has continued to invest to expand its coverage and capacity. In addition, all of the network operators have invested in infrastructure to deploy 4G, but this was especially challenging for the three mobile incumbents as their revenues were declining. For example, Orange's revenues declined, from €21,431 million in 2012 to €18,969 million in 2016 while its capital expenditure across all of its various operations in France dropped from €3,614 million to €3,421 million over the same period (Orange, 2013, 2017).

That Orange's capital expenditure in France has not dropped more reflects the continued need of operators to invest in infrastructure to deliver 'quad-play' services on the one hand, and to cope with increasing volumes of traffic. Indeed, when capital expenditure related solely to mobile is identified, then the amount is remarkably stable – as Figure 4 illustrates, mobile investment excluding licence fees has been over the €2 billion per year between 2011 and 2015. It is impossible to say whether a three-operator market would have generated more investment that a four-operator market in France, but a pan-European study concludes that more concentrated markets lead to higher investment per operator while "the total industry investment does not change significantly" (Genakos, Valletti and Verboven, 2018: 3).

[Insert Figure 4 about here]

6.5 On the choices open to its competitors

The three competitors of Free Mobile - Orange, SFR and Bouygues Telecom - had several options open to them, but none of them was obvious or optimal. The rivals to Free Mobile could, of course, compete against it in a head-to-head battle based on a low-price strategy. But in a saturated market with a significant level of churn, the expected gain in terms of the number of customers would be limited while the price based competitive strategy would almost certainly reduce revenues. Thus, other options need to be considered.

One way to maintain profits at an acceptable level in such an environment would be to reduce costs. Broadly speaking, two alternative options exist: cost reduction or (partially) exit

the market. French mobile operators have been able to make significant cost reductions,[9] though only one operator has been able to exit the market: Vivendi sold SFR to Altice in 2004 – see below.

The second strategy opened to the rivals of Free Mobile is to try to escape the price war it initiated. One option here would be to go upmarket, that is, target the more affluent and demanding customers. The launch of 4G offered the rivals of Free Mobile a means through which this strategy could be implemented, though this was short-lived as the price war soon encompassed 4G on the same terms as 3G. Another possibility was to try to lure customers with services from outside the mobile market. As the four French mobile operators are converged operators, so it was possible to imagine strategies built on the development of fixed broadband ('quadruple play') or content distribution (Bouygues, 2013). This strategy has also been tried, though with mixed results.

A third strategy that the rivals of Free Mobile could adopt is to attempt to compensate the poor financial results in France through expanding into other countries and/or industries. All three of the rivals are owned by parent companies with extensive operations outside of the French mobile telecommunications market, but the sheer size of the domestic mobile operations ensures that they cannot simply sit by and wait for market conditions to change in their favour.

6.6 When (nearly) everybody tries to deal and (possibly) merge with (nearly) everybody

With only four mobile operators, the merger combinations are not endless. In both 2011 to 2012, Orange was the market leader and thus beyond the reach of its French competitors. Free had an aggressive strategy, but it needed a national network immediately to launch its mobile services. Although SFR was the traditional challenger of Orange, with a large customer base, Vivendi, its parent company and a diversified media group, was uncertain about its own future strategy (de Rochegude, 2012). Finally, Bouygues Telecom was the smallest mobile operator, probably too small to remain independent in the long term, but it was a subsidiary of a powerful and well-established construction and media group that provided sufficient support to relieve the need to act immediately.

In 2011 Free Telecom signed a roaming agreement with Orange to be able to offer nation-wide services in the period when it would be building its own network. This move was

[9] For example, the total savings of Bouygues Telecom amounted to €599 million from 2012 to 2013 while its sales decreased 11 per cent to €4.7 billion. After SFR was bought by Altice in 2014, a drastic savings plan was also implemented so while the number of customers declined profits increased (Belouezzane and Cassini, 2015).

highly criticized by SFR and Bouygues (Hocepied and Held, 2011), but the regulator did approve it. The Orange network was large enough to accommodate the traffic associated with a few million extra customers for a while, and Orange reportedly charged Free around €500 million in 2012, €700 millions in 2013 and €2014 (Geugneau and Godelcuk, 2014). Orange, SFR and Bouygues Telecom were bound to suffer because of the very low prices charged by Free Mobile, but Orange at least benefited from this roaming agreement. ARCEP insisted that this agreement was only temporary in order to for infrastructure-based competition to develop. The initial term of the agreement was until 2016 for 3G and 2018 for 4G. In June 2016, Orange and Free decided to terminate the agreement in 2020 for 2G/3G with a gradual transition (Iliad, 2016b).

[Insert Table 2 about here]

[Insert Figure 5 about here]

In a second move, SFR and Bouygues decided to share part of their networks in 2013 to reduce operational costs by between 20% and 25% (Abboud, 2014; Sahota, 2014). This occurred when Vivendi was already contemplating the sale of SFR. Bouygues made an offer to buy SFR as well, but contrary to expectations, Vivendi sold SFR to Altice and not to Bouygues (Mobile World Live, 2014). Bouygues was extremely angry at this sale, but the network-sharing agreement between Bouygues Telecom and SFR remained in place and was progressively implemented.[10]

Altice is the parent company of the cable operator Numericable. The sale of SFR to Altice was reportedly due to the better financial return for cash-strapped Vivendi while simultaneously presenting no risk of competition policy issues derailing the sale, as there would still be four mobile operators in the market. Moreover, Altice promised not to cut jobs before 2017 and the track record of Patrick Drahi, the head of Altice, demonstrated a propensity for turning around troubled businesses. From an operational point of view, the merger offered the potential for synergies between the cable and the mobile network. That the sale of SFR to Altice occurred despite the then Minister of Industry Arnand Montebourg publicly backing a three operator mobile telecommunications market (Diebold, 2014), arguing that this structure was the best placed to protect employment and investment in France (Belouezzane, 2014b).

[10] In May 2015 the four mobile operators have also signed an agreement to cover the least densely populated areas. This amounted to around €40 million per year, with Orange contributing 40 per cent.

The last significant event worth noting happened at the turn of 2015 / 2016 when Orange announced that it had started merger talks with Bouygues Telecom (Scott, 2016). This development, which was arguably of great strategic importance to Orange, involved numerous parties with different goals and corporate cultures so it was not a surprise it failed (TeleGeography, 2016).

While it was not officially presented in this way, the idea mooted while the merger discussions were ongoing was to dismember Bouygues Telecom, with each of the remaining three mobile operators buying part of its assets. Bouygues expected to obtain a good price for its telecommunication operations and a presence on the Orange board. Orange, as market leader, however, could not add all the Bouygues Telecom customers to its own without reaching a market share that the Competition Authority would find unacceptable. Thus, Orange would retain only some of the customers while SFR was interested in the low-cost operations of Bouygues Telecom (Belouezzane and Cassini, 2016). For its part of the dismemberment of Bouygues Telecom, Free Mobile would buy some of the retail stores and the mobile infrastructure – purchasing the network was complicated by the fact that Bouygues Telecom and SFR shared infrastructure. The cost synergies were estimated to be between €5 and €10 billion, shared unequally among the three remaining mobile operators, a sum that compares favourably with the rumoured €10 billion value placed on Bouygues Telecom (TeleGeography, 2016).

The government – the French Competition Authority, ARCEP and the Minister of the Economy and Industry – were also involved in the discussion to dismember Bouygues Telecom. As the French Government was a significant shareholder of Orange, the Minister insisted that the purchase of Bouygues by Orange would not dilute his own stake or cost Orange too much (Le Figaro, 2016). In addition, the Competition Authority had made it clear that it did not want the market power of Orange to increase. Finally, ARCEP wanted to maintain the momentum regarding investment but was neutral as regards the number of operators and the impact that this would have tariffs (ARCEP, 2016a). After a round of negotiations in April 2016, the deal collapsed (Bembaron, 2016), with the consequence that Bouygues Telecom, the smallest and least profitable of the mobile operators, remained independent. The consolidation saga within France may not be over, with some analysts recently predicted that SFR, which is currently experiencing reduced profitability, could be acquired by Bouygues Telecom and Iliad (Universfreebox, 2018)

7. Discussion

The previous section has demonstrated the multi-faceted impact of Free Mobile on the French mobile telecommunications market. As shown in Figure 6, the impact is both direct and indirect. Iliad, the parent company of Free Mobile, initially entered the broadband telecommunications market, and thus already owned useful assets such as a backbone network, customer base and reputation, as well as a low-cost culture. This, when combined with a broadly supportive regulatory and political environment, facilitated the entry of Free Mobile (box 1, Figure 6). The national roaming agreement Free Mobile signed with Orange not only enabled it to offer its services across France, but also partially delayed its need to invest in infrastructure (box 2). This, in turn, allowed the operator to continue with its strategy of low prices, thereby attracting subscribers and allowing it to become profitable.

[Insert Figure 6 about here]

As Free Mobile competed on low prices and attracted subscribers, the other three operators lost market share (box 3). To counter the success of Free Mobile, the other operators lowered their own prices and copied elements of its business model. These strategies, however, were not sufficient – SFR, Orange and especially Bouygues Telecom incurred financial losses, thereby encouraging them to change their strategies vis-à-vis Free Mobile. To combat the attractiveness of Free Mobile's 3G-based services, the other operators accelerated the launch of 4G, reducing their costs through sharing infrastructure (box 4).

As prices fell and operators experienced financial losses, they began to explore how the structure of the market could be changed through merger and acquisition activity (box 5). From late 2012 onwards, several possible combinations were discussed but all of them ultimately failed, with the only significant deal to go ahead being Vivendi's sale of SFR to Numericable. This sale maintained the number of operators in the market, and thus perpetuated the competitive pressures faced by all mobile operators.

As the most obvious exit strategies, all of which centre around Bouygues Telecom, are now infeasible, the attention of mobile operators has shifted to other options. Not only have they sought to reduce their costs through announcing a series of job losses, but they have also embraced many elements of the innovative business model used by Free Mobile. These issues are, of course, related: the adoption of online retailing by the established operators contributed to the exit of The Phone House from the French market. Having said this, the extent to which the established mobile operators can copy Free Mobile's business model is limited. Orange, Bouygues Telecom and SFR have been established for much longer than Free Mobile, with all that this entails in terms of legacy investments and higher costs. As reducing their

headcount can only reduce their costs so far, it is likely that Orange and SFR will once more discuss acquiring Bouygues Telecom as it is only through such a merger can they significantly change their cost structure to compete with the lower prices offered by Free Mobile. However, the recent market and financial difficulties of SFR, which are apparently benefiting Bouygues Telecom (Capital, 2017), have given rise to speculation that Bouygues Telecom and Illiad could acquire SFR (Universfreebox, 2018).

8. Conclusion

This paper has explored the impact that Free Mobile has had on the French mobile telecommunications market. Our analysis has demonstrated that this impact has been widespread, irrevocably changing the market dynamics and the way operators compete as a consequence. As the last entrant into the French mobile telecommunications market, Free Mobile could have chosen a 'me too' strategy and competed in a similar fashion to Orange, Bouygues and SFR. This did not happen, and for this reason it made its entry even more disruptive than would have otherwise been the case. External factors, which are not really considered in the mainstream disruption theory, have played a significant role in this disruption. In particular, the entry of Free into the French mobile market was facilitated by the conditions set by the national telecommunications regulator. Free Mobile benefitted from a lower license cost, reduced call termination charges and was also allowed to sign an initial roaming agreement, This was not the case when Bouygues Telecom entered the market in 1996 – it had to slowly and painstakingly build its own network to attract customers, though it was worth noting that the market was at that time still growing. To a certain extent, it can be considered that the regulator has been disruptive. Paradoxically, regulatory concerns also prevented disruption to fully unfold as they restricted the possibilities of restructuring in order to avoid a situation of market dominance. Vivendi was able to sell SFR for a sum that with hindsight was too high, but despite numerous attempts the Bouygues Group have not been able to find a solution to the challenges faced by its mobile subsidiary. The network sharing agreement between Bouygues Telecom and SFR did provide some respite, but this was only temporary. While regulatory decisions set some of the decisive factors for disruption, it should be also stressed that the specific character of the new entrant played an important role. Internal factors, in particular, the resources and competences of the parent company, do matter. As a convergent operator, Iliad benefited from complementary assets that made it possible to pursue an aggressive strategy. The company started with a core network to carry traffic, an installed base of customers, a reputation and had already mastered the main

activities of being a telecommunications operator. These complementary assets allowed significant economies of scope with the company's new mobile activities. It is arguably the case that a pure play mobile operator would not have been able to pursue the same strategy while remaining profitable at the same time. Iliad's charismatic and visionary leader can also be considered as a decisive resource inherited by Free Mobile.

The level and pattern of disruption has been also influenced by the demonstrable 'culture shock' between the four chief executives of the mobile operators (Belouezzzane, 2014a). Orange and SFR (when it belonged to Vivendi) were run by members of the French administrative elite who are generally more interested by global strategies than disruptive endeavours.[11] Martin Bouygues, the owner of Bouygues Telecom, created the operator drawing on the resources of the Bouygues Group and is well connected with conservative politicians (Godeluck and Paquette, 2016). In contrast, Free has been created by Xavier Niel, a self-made man and entrepreneur with an anti-establishment attitude and a public scorn for the traditional French elites – see, for example, Godeluck and Paquette (2016) or Journal du Dimanche (2013) for illustrations of this anti-establishment and entrepreneurial stance.

The analysis of Free Mobile's entry also raises a number of policy implications. Firstly, the characteristics of operators and the strategies followed have an impact on the level of competition and of benefits that accrue to customers. Our analysis suggests that a new entrant is more likely to be both aggressive and profitable if it can use complementary assets allowing for economies of scope with the new activities. Thus, a converged operator seems more likely to have a strong impact on competition and to be more sustainable than a pure mobile operator would. The will to be disruptive, as exemplified by the personality of Xavier Niel, can also play a role. Secondly, our analysis shows how difficult it is to reconcile different industrial and competition policy objectives. To some extent, the concerns expressed before the entry of Free Mobile by incumbents have proven to be true: not only has employment and profitability in the industry have been severely affected, but the incumbents have been globally weakened with two of them experiencing difficulties in maintaining the sustainability of their operations.

Our analysis has focused on the entry of a single mobile operator within a specific country, and has allowed us to explore a particular pattern of disruption. By adopting an

[11] That is, alumni of the prestigious Ecole Polytechnique (X) or Ecole Nationale d'Administration (ENA). Stéphane Richard, CEO of Orange is an ENA alumni and has worked in the cabinet of the Minister of Economy, while Jean-Bernard Levy, then head of Vivendi, is an X graduate who has also worked for several governments.

outcome-based approach to disruption other disruptive operators can be identified in mobile telecommunications markets, such as Hutchison's 3 in Europe, or Reliance Jio in India. These companies exhibit varying forms of disruption, with both similarities and differences with the case of Free Mobile being observable. As these companies all draw on the resources of their parent company, albeit in different ways, it would be informative to explore the impact that other types of entrants have on mobile telecommunication markets. Through comparing the entry of Free Mobile and Hutchison with, for example, Deutsche Telekom (partly state-owned foreign incumbent) or Vodafone (foreign operator) a better understanding of disruption in regulated industries is likely to emerge.

References

Abboud, L. (2014) "Regulator allows Bouygues-SFR network deal to go ahead", 25 September, available at: www.reuters.com

Autorité de la concurrence (2005) *Anti-competitive agreements in the mobile telephony market*, 1 December, available at: www.autoritedelaconcurrence.fr

ARCEP (2002) *Décision n^{o} 02−594*, 18 July, available at : www.arcep.fr

ARCEP (2007) *Décision n^{o} 07-862*, available at: www.arcep.fr

ARCEP (2009) *Décision n^{o} 09-1067*, available at: www.arcep.fr

ARCEP (2011a) *Décision n^{o} 11-1080*, 22 September, available at: www.arcep.fr

ARCEP (2011b) *Décision n^{o} 11-1510*, 22 December, available at: www.arcep.fr

ARCEP (2013) *Evolution des prix des services mobiles en France entre 2010 et 2012*, 23 May, available at: www.arcep.fr

ARCEP (2015a) *Décision n^{o} 15-1080*, 8 September, available at: www.arcep.fr

ARCEP (2015b) *Décision n^{o} 15-1454*, 16 December, available at : www.legifrance.gouv.fr

ARCEP (2016a) "C'est la fin de la régulation pro low cost": Sébastian Soriano, président de L'Arcep, réspond aux questions du Figaro, 7 April, available at: www.arcep.fr

ARCEP (2016b) *Electronic Communications Services in France, 1st quarter 2016. Observatory for the electronic communications market*, 7 July, available at: www.arcep.fr

ARCEP (2016c) *L'évolution des prix des services des communications électroniques – année 2016*, Annex 4, available at: www.arcep.fr

ART (2002) *ART publishes its ruling on a dispute between Télé2 and Orange*, 23 December, available at: www.arcep.fr

Axione (2017) *Free teams up with Axione for its FTTH offering*, 22 June, available at: www.iliad.fr

Baldwin, R. and M. Cave (1999) *Understanding regulation – Theory, strategy and practice*, Oxford University Press: Oxford, UK

Belouezzane, S. (2014a) "Trois hommes et la 4G", *Le Monde*, 27 February, p. 19.

Belouezzane, S. (2014b) "Télécoms: Bouygues écarte la consolidation de M. Montebourg", *Le Monde*, 15 May, p. 4.

Belouezzane, S. and S. Cassini (2015) "Numericable, un an de régime Drahi", *Le Monde*, 27 November, p. 4.

Belouezzane, S. and S. Cassini (2016) "Bouygues Telecom: le marchandage avant le dépeçage", *Le Monde*, 24 January, available at: www.lemonde.fr

Belouezzane, S. and C. Ducourtieux (2012) "L'entrée fracassante de Free dans le mobile", *Le Monde*, 11 January, p. 13

Bembaron, E. (2016) "Orange et Bouygues douchent les espoirs de consolidation des télécoms français", *Le Figaro*, 4 April, p. 22-23.

Best, I. (2012) "Free fait baisser l'indice des prix, c'est l'Insee qui le dit", *La Tribune*, 21 December, available at: www.latribune.fr

Bonora, T. and R. Dor (2013) "SFR rapatrie ses boutiques sur le Net", *Le Parisien*, 2 March, available at: www.leparisien.fr

Bourreau, M., Sun, Y. and F. Verboven (2018) *Market entry, fighting brands and tacit collusion: The case of the French mobile telecommunications markets*, available at: ssrn.com

Bouygues, M. (2013) "Martin Bouygues: "I am declaring war in the fixed broadband market", interview published in Le Figaro, 20 December, available at: www.bouygues.com

Bouygues Telecom (2018) *L'intégralité de notre histoire*, available at: www.corporate.bouyguestelecom.fr

Capital (2017) "Bouygues Telecom, la grand gagnant des difficultés de SFR", 16 November, available at www.capital.fr

Champeau, G. (2009) "Sarkozy se dit 'réservé' sur l'arrivée d'un 4ème opérateur mobile", *Numerama*, 15 September, available at: www.numerama.com

Chicheportiche, O. (2016) "Free entend accélérer dans la 4G et la fibre en 2016", *Zdnet*, 10 March, available at: www.zdnet.fr

Christensen, C. M. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*, Boston, MA: Harvard Business School Press

Christensen, C. M., and M.E. Raynor (2003). *The innovator's solution*, Boston, MA: Harvard Business School Press.

Christian, D. (2015) "4G en bande 1800 MHz: le refarming autorisé pour Orange et SFR, après Bouygues Telecom", *GNT*, 31 July, available at: www.generation-nt.com

The Connexion (2013) "Phone House pulls the plug", 30 April, available at: www.connexionfrance.com

Conseil de la concurrence (2005) *The Conseil de la concurrence imposes fines totalling 534 million euros on Orange France, SFR and Bouygues Telecom, Communique du conseil de la concurrence*, 1 December, available at: www.quechoisir.org

Curwen, P. (1997) *Restructuring telecommunications – A study of Europe in a global context*, Macmillan: Basingstoke, UK

Curwen, P. (2002) *The future of mobile communications – Awaiting the third generation*, Palgrave: Basingstoke, UK

Curwen, P. and J. Whalley (2006) "Third generation new entrants in the European mobile telecommunications industry", *Telecommunications Policy*, Vol.30 (10/11), pp. 622-632.

Curwen, P. and J. Whalley (2010) *Mobile telecommunications in a high-speed world: Industry structure, strategic behaviour and socio-economic impact*, Gower: Aldershot, UK

Curwen, P. and J. Whalley (2011) "Mobile communications gives birth to a fourth generation: An analysis of technological, licensing and strategic implications", *info*, Vol.13 (4), pp. 42-60

Curwen, P. and J. Whalley (2013) *Fourth generation mobile communications – The path to superfast connectivity*, Springer: Heidelberg, Germany

Curwen, P. and J. Whalley (2015) "Can new entry provide a route for increased competition in mobile communications?", *info*, Vol.17 (5), pp. 17-37

Curwen, P. and J. Whalley (2016) "European mobile markets and the doctrine of '4 networks good, 3 networks bad", *info*, 18 (5), pp. 1-23

Daidj, N. and P. Vialle (2011) “Strategic moves related to broadband diffusion on the French VoD and TV market”, *Adoption, Usage and Global Impact of Broadband Technologies: Diffusion, Practice and Policy*, Dwivedi, D.W., editor, IGI Global: Hershey, Pennsylvania

Dauret, L. (2012) “Xavier Niel, le ‘capitalisme cool’ à l’assaut des médias: la construction d’un empire”, *Acrimed*, available at: www.acrimed.org

Deffains, B. (2012) “Pourquoi Free Mobile met l’emploi en danger”, *Les Echos*, 18 December, p. 13

Diebold, J-B (2014) “Dans la tête de l’arbitre des télécoms”, *Challenges*, 13 March, available at: www.challenges.fr

Les Echos (2004) “L'introduction d'Iliad en Bourse est un succès”, *Les Echos*, 2 February, available at: www.lesechos.fr

Les Echos (2013) “France Télécom n'a pas bradé son réseau auprès de Free”, 10 January, available at: www.lesechos.fr

Elixmann, D., Godlovitch, I., Henseler-Unger, I., Schwab R. and U. Stumpf (2015) *Competition and investment: An analysis of the drivers of investment and consumer welfare in mobile telecommunications,* A study for Ofcom, July, Bad Honnef: Germany

European Commission (2009a) *Digital Agenda for Europe – France*, available at: ec.europa.eu

European Commission (2009b) *Progress report on the Single European Electronic Communications Market 2008*, 14th report, 25 March, available at: ec.europa.eu

European Commission (2009c) *Broadband access in the EU: situation at 1 July 2009*, COCOM09-29 Final, 18 November, Brussels, Belgium.

European Commission (2011) *State aid: The procedure for awarding France’s fourth 3G mobile phone licence did not involve state aid*, IP/11/555, 10 May, Brussels, Belgium.

European Commission (2015a) *Mergers: Commission opens in-depth investigation into the proposed merger of TeliaSonera and Telenor’s Danish telecommunication activities*, 8 April, Brussels, Belgium.

European Commission (2015b) *Statement by Commissioner Vestager on announcement by Telenor and TeliaSonera to withdraw from proposed merger*, 11 September, Brussels, Belgium.

European Commission (2016) *Mergers: Commission prohibits Hutchison’s proposed acquisition of Telefonica UK*, 11 May, Brussels, Belgium.

L’Express L’expansion (2012) “Free Mobile a-t-il assez investi dans son réseau?”, 12 March, available at: lexpansion.lexpress.fr

Ferret, Y. (2014) “15 ans de Free… en 15 dates”, *Freenews*, available at: www.freenews.fr

Le Figaro (2008) “Interview of Maxime Lombardini, President of Free”, 4 December, p. 21

Le Figaro (2010) “Iliad augmente son bénéfice de 75% en 2009”, 23 March, available at: www.lefigaro.fr

Le Figaro (2016) “Nous étions quatre à la table des négociations mais nous n’étions que trois à vouloir aboutir”, 4 April, available at: www.bouygues.com

Freenews (2012) “Free Mobile: le forfait 2€ passe à 2h + SMS illimités!”, 6 December, available at: www.freenews.fr

French Web (2012) “Free Mobile aurait déjà seduit près de 2 millions de clients”, *French Web – Le Magazine de L’Innovation*, 9 February, available at: www.frenchweb.fr

Genakos, C., Valletti, T. and F. Verboven (2018) “Mobile telephony”, *Economic Policy*, Vol.33 (93), pp. 45-100.

Geugneau, R. and S. Godeluck (2014) “Bouygues hausse le ton face au contrat Free-Orange”, *Les Echos*, 14 January, p. 21

Godeluck, S. (2012) “Free en piste pour accroitre d’un tiers son chiffre d’affaires”, *Les Echos*, 16-17 November, available at: www.lesechos.fr

Godeluck, S. (2014) “Numericable va avaler Virgin Mobile pour 325 millions d’euros”, *Les Echos*, 19 May, p. 23.

Godeluck, S. and E. Paquette (2016) *Xavier Niel, la voie du pirate*, First Editions: Paris, France.

Le Goff, R. and J.A. Rojas (2015) “Is the French case illustrating that competing operators and regulatory strategies force telecom services to become a commodity?”, *Competition and Regulation in Network Industries*, Vol.16 (4), pp. 314-344.

Gomm, R., Hammersley, M. and P. Foster (2000) “Case study and generalisations”, in, Gomm, R., Hammersley, M. and P. Foster, editors, *Case study method: Key issues, key texts*, SAGE: London, UK.

Gruber, H. (2007) “3G mobile telecommunication licences in Europe: A critical review”, *info*, Vol.9 (6), pp. 35-44.

Hocepied, C. and A. Held (2011) “The assignment of spectrum and the EU state aid rules: the case of the 4th 3G licence assignment in France”, *Competition Policy Newsletter*, number 3, available at: ec.europa.eu

Houngbonon, G.V. (2015) “The impact of entry and mergers on the price of mobile telecommunications services”, *26 European regional conference of the International Telecommunications Society*, 24th – 27th June, Madrid, Spain.

Iliad (2003) *Free lance la téléphonie gratuite!*, 31 July, available at: www.iliad.fr

Iliad (2004) *Iliad Annual Report 2003*, available at: www.illiad.fr

Iliad (2005) *Iliad Annual Report 2004*, available at: www.iliad.fr

Iliad (2006a) *HD Freebox: #1 installed base of HD digital video recorder in France*, 30 August, available at: www.iliad.fr

Iliad (2006b) *300,000 HD Freeboxes installed: A new-generation nomadic network*, 5 October, available at: www.iliad.fr

Iliad (2008) *Iliad et Telecom Italia finalisent la cession d’Alice France*, 26 August, available at: www.iliad.fr

Iliad (2009a) *Iliad Annual Report 2008*, available at: www.iliad.fr

Iliad (2009b) *Valenciennes, a pioneer in very high speed Internet access*, 4 December, available at: www.iliad.fr

Iliad (2010) *Iliad Annual Report 2009*, available at: www.iliad.fr

Iliad (2011a) *Document de Reference 2011 – Rapport Financier Annuel*, available at: www.iliad.fr

Iliad (2011b) *Free Mobile and Orange sign a 2G agreement and agree to extend this to 3G networks,* 3 March, available at: www.iliad.fr

Iliad (2012a) *Free mobile offer: the best offer twice as cheap*, 10 January, available at: www.iliad.fr

Iliad (2012b) *New €2 mobile plan: Reach out even more. Pay 4 times less*, 6 December, available at: www.iliad.fr

Iliad (2013) *Free Mobile Plan: From now on, up to 2 "Free Mobile Plans" at the reduced price of €15.99/month for each Freebox subscription,* 28 May, available at: iliad.fr

Iliad (2014) *Press release – 2013 Annual Report,* 10 March, available at: www.iliad.fr

Iliad (2015) *2014 Results,* 12 March, available at: www.iliad.fr

Iliad (2016a) *2015 Results*, 10 March, available at: www.iliad.fr

Iliad (2016b) *Free Mobile et Orange ont signé ce jour un avenant à leur contrat d'itinérance 2G/3G*, 15 June, available at: www.iliad.fr

Iliad (2017) *2016 Results,* 7 March, available at: www.iliad.fr

INSEE (2012) *Les prix à la consommation baissent de 0,2% en novembre 2012*, available at: www.insee.fr

Journal du Dimanche (2013) Xavier Niel : "J'ai beaucoup de peine pour mes concurrents", 15 December, p. 24.

Jurispedia (2009) *L'attribution des licences UMTS*, available at: fr.jurispedia.org

Landier, A. and D. Thesmar (2012) *L'impact macroéconomique de l'attribution de la quatrième license mobile,* 25 November, available at: http://studies2.hec.fr

de Mesnard, L. (2011) "More firms, more competition? The case of the fourth operator in France's mobile phone market", *International Journal of Production Economics*, Vol. 130, pp. 186-195.

Mobile World Live (2014) *Vivendi closes €17bn SFR sale*, 28 November, available at: www.mobileworldlive.com

Le Monde (2005) "Les trois opérateurs de téléphonie mobile français accusés d'un Yalta du portable", 23 August, available at: www.lemonde.fr

Le Monde (2010) "Le Conseil d'Etat confirme l'attribution à Free de la 4e licence 3G", 12 November, available at: www.lemonde.fr

Le Monde (2013) "Free inaugure à son tour son réseau 4G", 3 December, available at: www.lemonde.fr

NPA Conseil (2006) *Le développement de la video à la demande en France et en Europe,* Paris, France.

NPA Conseil (2008) *Vidéo à la demande en Europe: second recennsement des servuces de VOD,* Paris, France

Nouvelobs (2012) "Les ripostes d'Orange, SFR et Bouygues à Free mobile", 13 January, available at: o.nouvelobs.com

OECD (2009) *Communications Outlook,* OECD: Paris, France

OECD (2015) *Wireless market structures and network sharing,* Working party on communication infrastructures and service policy, DSTI/ICCP/CISP(2014)2/FINAL, 8 January, OECD: Paris, France.

Ofcom (2016) *A cross-country econometric analysis of the effect of disruptive firms on mobile pricing,* Ofcom: London, UK.

Official Journal of the European Communities (1987) *Council recommendation of 25 June 1987 on the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community*, 17 July, 196/81, Brussels, Belgium/

Orange (2013) *2012 Registration document,* available at: www.organge.com

Orange (2017) *2016 Registration document,* available at: www.organge.com

Park, E-U. (2009) "Explicating barriers to entry in the telecommunications industry", *info*, Vol.11 (1), pp. 34-51.

Penard, T. (2001) *Comment analyser le succès de la téléphonie mobile en France?* September, available at: perso.univ-rennes1.fr

Le Point (2008) "Rachat d'Alice: Free a gagné, au prix fort", 9 June, available at: www.lepoint.fr

Premier Ministre (2009) *Service de presse – Communique de presse*, 12 January, available at: www.arcep.fr

Rabreau, M. (2014) "Le PDG de Free, Xavier Niel, sacré patron 'idéal' par les Français", *Le Figaro*, 2 February, available at: www.lefigaro.fr

Renault, M-C (2012) "FO redoute 2000 départs chez SFR et interpelle Montebourg", *Le Figaro*, 1 December, available at: www.lefigaro.fr

Renault, M-C. (2013) "Free reste très rentable malgré le lancement du mobile", *Le Figaro*, 20 March, available at: www.lefigaro.fr

de Rochegude, A. (2012) "Viendi, la stratégie Fourtou", *Stratégies*, 5 July, available at: www.strategies.fr

Sahota, D. (2014) "Bouygues Telecom and SFR enter into network sharing agreement", *Reuters*, 3 February, available at: www.reuters.com

Sanyas, N. (2009) "Licence 3G: Numericable et Virgin Mobile laissent planer le doute", Nextinpact, available at: www.nextinpact.com

Scott, M. (2016) "Orange in talks to acquire Bouygues Telecom", *The New York Times*, 5 January, available at: www.nytimes.com

TeleGeography (2016) "Orange, Bouygues merger talks collapse", *TeleGeography*, 4 April, available at: www.telegeography

La Tribune (2012) "Free Mobile: après le 'buzz', les premiers "bugs", 18 January, available at: www.latribune.fr

La Tribune (2013) "Free Mobile: retour sur une année folle en 30 dates et son lot de polémiques", 6 December, available at: www.latribune.fr

Univers Freebox (2018) "Les analystes de Raymond James reparlent de consolidation, avec un rachat de SFR par Bouygues et Free", 18 January, available at www.universfreebox.com

Vialle, P. (1998) *Stratégies des opérateurs de télécoms,* Hermès: Paris, France.

Zdnet (2011) “La détente entre Free et Orange: Free Mobile utilisera le réseau d'Orange pour la 3G”, 3 March, available at: www.zdnet.fr

Table 1 – Major job cuts announced by French telecommunication companies

Telecommunications company	Date	
Bouygues Telecom	September 2012	556 jobs, all voluntary departures
SFR	November 2012	850 jobs, all voluntary departures
Orange	2012 - 2015	5,000 jobs through not replacing retiring employees
French call centers	2012 - 2014	8,000 jobs, with some being moved offshore
The Phone House	2013 - 2014	1,200 redundancies
Bouygues Telecom	September 2014	1,400 jobs, all voluntary
SFR	2016 - 2018	5,000 jobs, with most of them being voluntary

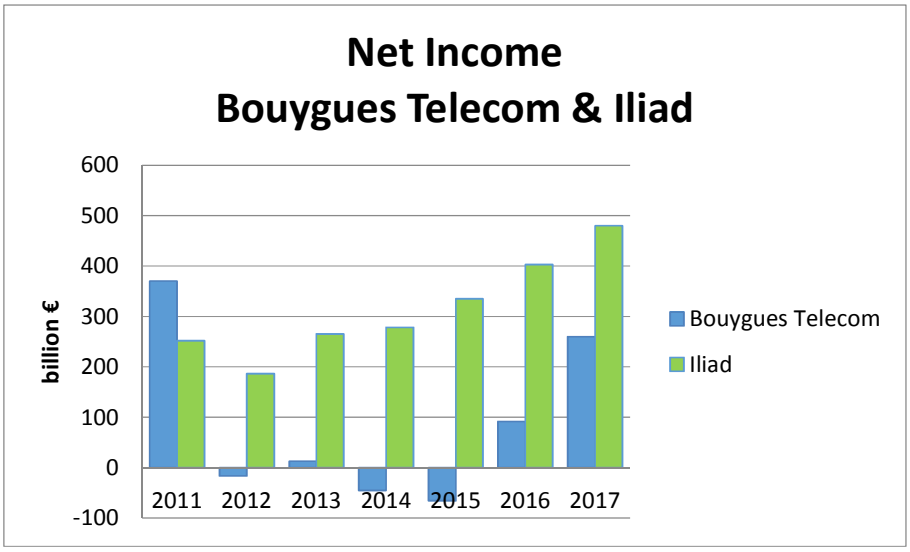
Source: compiled by the authors from a variety of sources

Table 2 – Mobile mergers and acquisition rumours and talk

Date	Proposed merger	Pros and cons	Outcome
2012, October	Free to buy SFR	Lots of synergies, with a large merged company resulting. No cash to Vivendi	Failure
2014, February	Bouygues proposes merger with SFR	Bouygues and SFR share their network, so no competition policy issues emerge	Failure
2014, March	Numericable proposes to buy SFR	Welcome exit for Vivendi. Numericable becomes a converged operator 4 operators maintained	Vivendi sells SFR to Numericable
2014, April	Free to buy Bouygues Telecom		Failure
2014, May	Orange to buy Bouygues Telecom	Competition policy issues Price sought by Bouygues too high Bouygues Telecom believes that it can survive alone	Failure
2014, November and June 2015	Numericable to buy Bouygues Telecom		Failure
2016, January	Orange proposes to buy Bouygues Telecom and break it up	Lots of competition policy issues due to Orange being the market leader Long and complex negotiations	Failure
2018, Spring	Bouygues offers to buy SFR	Lots of synergies, with a large merged company resulting.	Unknown (as of June 2018)

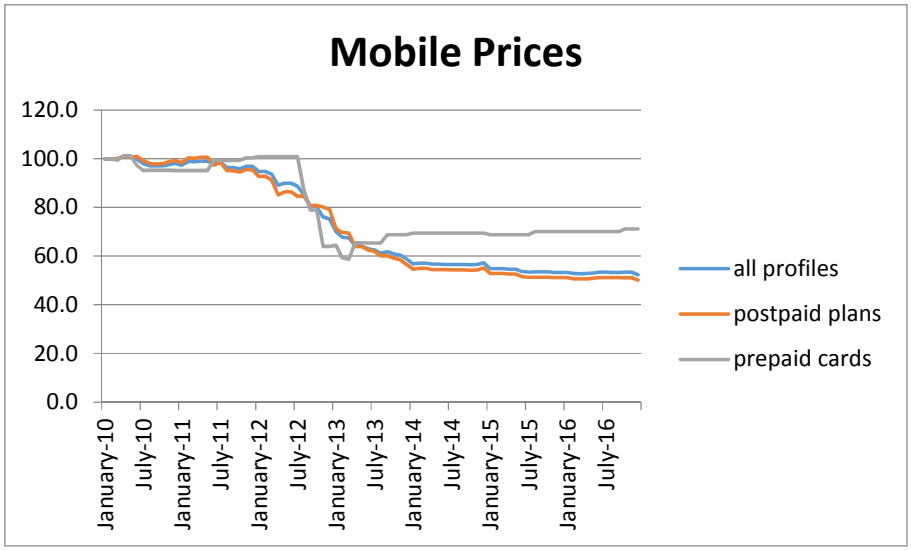
Source: compiled by the authors from a variety of sources

Figure 1 – Net income, Bouygues Telecom and Iliad 2011-2017



Source: compiled by the authors from the annual reports of Bouygues Telecom and Iliad

Figure 2 – Mobile services price index, 2010-2016



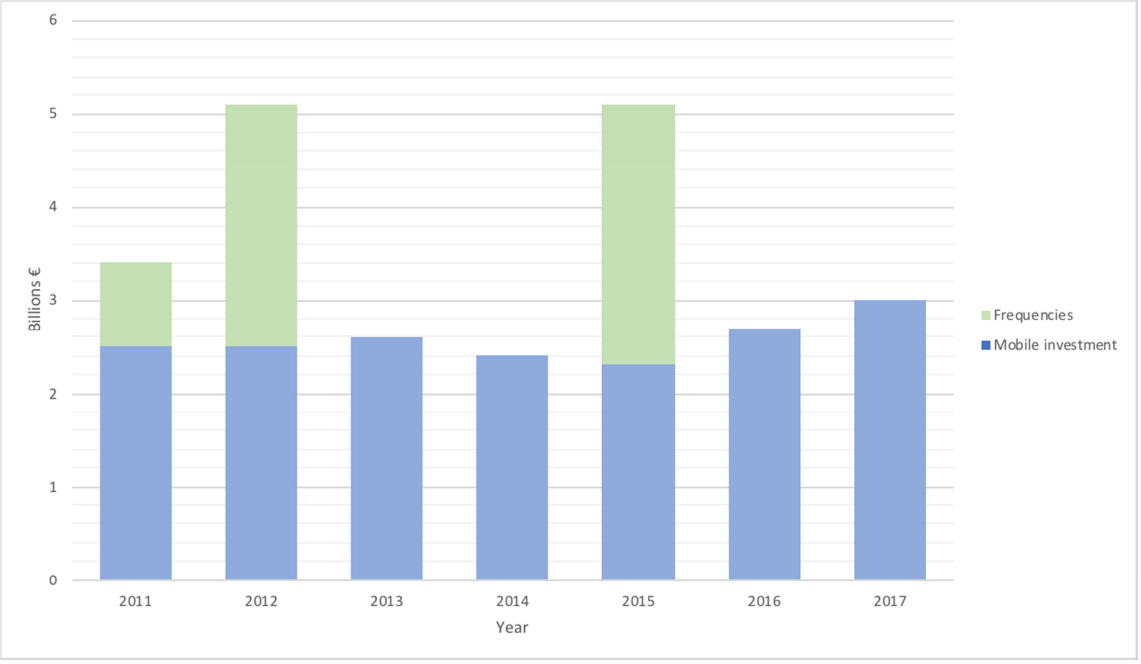
Source: compiled by the authors from data published by ARCEP

Figure 3 – Direct employment by French telecommunication operators, 2005-2017



Source: compiled by the authors from data published annually by ARCEP

Figure 4 – Investment in mobile infrastructure, 2011-2017



Source: compiled by the authors from data published annually by ARCEP

Figure 5 – Everyone wants to buy everyone else

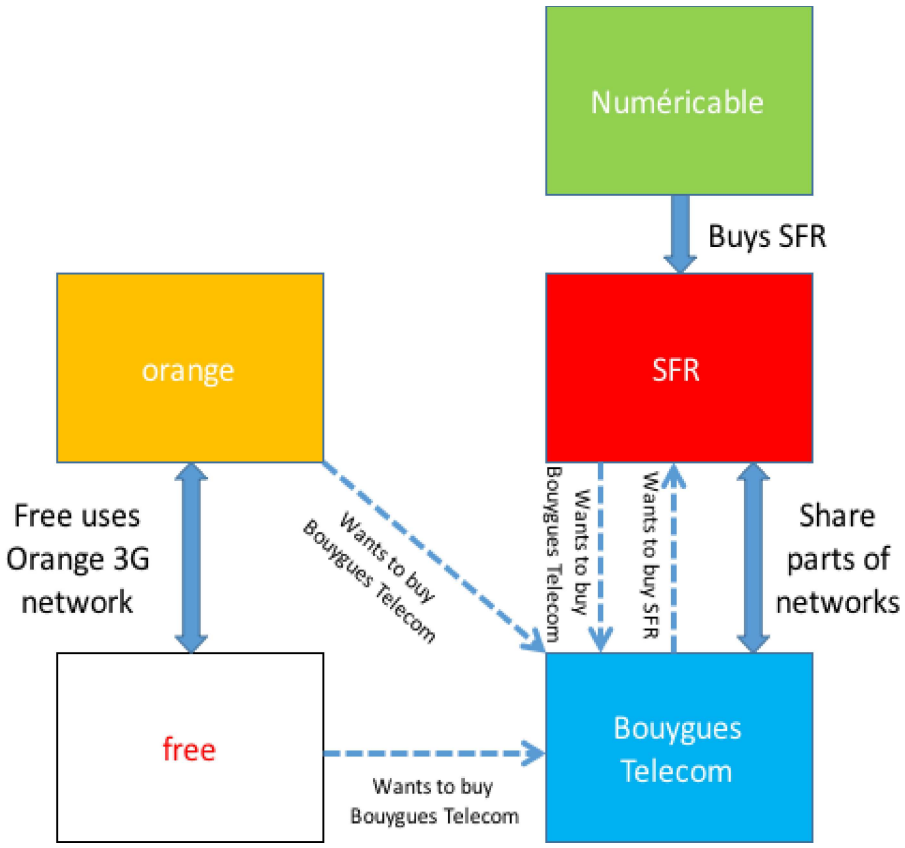


Figure 6 – The impact of Free Mobile on the French telecommunications market

