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Competing for Policy: Lobbying in the EU Wholesale Roaming Regulation

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Abstract

This work examines regulatory changes to the EU wholesale roaming market that were designed to facilitate the previously ratified roam-like-at-home (RLAH) policy in the retail market through the lens of the framework of political market for policy. This regulation was strategic not only for the European Commission, which sought to develop a single digital EU market, but also for telecommunications operators because of its impact on revenues. By studying written submissions and the options chosen in response to specific questions asked during the public consultation, we use topic modelling to identify two main focuses of the debate or clusters of stakeholders—one concerned with fair use policy issues and other with price issues. However, stakeholders lobbied for different outcomes even within a cluster, demonstrating intense competition among policy demanders. This fragmentation on the demand side of the political market provided room for the policy supplier, the European Commission, to react to lobbying efforts impartially. Regression results show that the Commission did not consistently favour certain stakeholders with specific characteristics. Instead, the Commission was consistent with its political agenda to promote a competitive internal market, and the public consultation in effect gave legitimacy to the regulatory changes.

Keywords: European Union, Telecommunications, Wholesale Roaming Market, Regulation, Lobbying
JEL codes: D72, L50, L86

1 Introduction

The European Union (EU, hereafter) has been a pioneer in regulating international roaming (Bourassa et al., 2016). Since 2007, when the first roaming package entered into force, European institutions have continually worked to enhance the roaming regulation framework, considered an essential issue for building the long-targeted EU single market.

One of the most recent achievements in this regard was the approval of "Roam Like at Home" (RLAH), a regulation stating that EU mobile users would no longer pay roaming charges while visiting another EU country. The European Commission was the author of this regulation, which is a strategic demonstration of the Commission's concern for serving EU citizens' interests as well as for advancing the EU single market. Such a change in the roaming retail market implied a necessary review of wholesale roaming regulation. As it generates significant revenues for some operators and imposes expenses on others, they actively participated in the policy-making process, trying to influence policy outcomes.

A remarkable particularity of this regulation is that it does not directly affect consumers because retail market regulation is already in place. Nevertheless, there was stiff competition among business stakeholders due to their different profiles. The European telecommunications landscape comprises a variety of actors that contrast in their market roles (standard operators versus virtual operators), in their business models, and in characteristics such as the number of countries in which they operate, the number of subscribers they have, and geographical and regulatory issues in their operating countries. In such a scenario, interests, and thus policy preferences, are diverse. Therefore, the following question arises: How is lobbying organised in this environment of conflicting interests between stakeholders of the same nature?

This study examines lobbying strategies in the policy-making process of EU wholesale roaming regulation through the perspective of a political market (Bonardi et al., 2005), where business representatives are the policy demanders and the European Commission is the policy supplier. In this political market, stakeholders lobby for their intended outcome through different channels. One significant and relatively transparent channel for lobbying is the public consultation conducted by the Commission prior to the drafting of the proposal for a regulation, which is our primary source of information to investigate the deployment of lobbying strategies in this case. Moreover, we resort to additional lobbying information and market indicators to perform the analysis. We use both textual analysis tools and regressions to examine firms' and the Commission's decision-making and the alignments between them.

This paper is structured as follows. Section 2 reviews the relevant literature about lobbying and political markets. Section 3 provides an overview of the political market for wholesale roaming regulation in the EU and explains the policy-making process in detail. Section 4 gives a general assessment of the textual submissions provided by stakeholders and looks for differences between them. Section 5 analyses selected issues and examines the relationships between various factors and the alignment of the stakeholders' and the Commission's positions. Section 6 presents a discussion of the results through the lens of political market for policy. Section 7 draws the paper to a conclusion.

2 Theoretical Background

Not only the market environment, but also the nonmarket environment, is important to firms' performance. The latter refers to the social, political, and legal arrangements relevant to firms' operations (Baron, 1995). In this context, the nonmarket environment, mainly the political environment, is especially important for firms operating in regulated markets where governmental authorities have the power to create or block market opportunities. Therefore, neither strategies targeting only the market environment nor those targeting only the nonmarket environment are sufficient to guarantee a firm's performance, which depends on the integration of both. In this approach, called integrated strategy, nonmarket strategies facilitate the deployment of market strategies and are, in turn, designed with these latter in mind (Baron, 2013).

The political environment can be conceptualised as markets for public policies where firms, political representatives and other stakeholders interact. In political markets, firms are policy demanders interested in securing or improving a sustainable environment for their businesses, whereas politicians and bureaucrats are the policy suppliers with the power to enact legislation with significant impacts on economic activities (Bonardi et al., 2005). Therefore, firms will actively develop corporate political strategies, which are nonmarket strategies addressed to political institutions to attempt to align the business environment to their preferences. Some of the results documented in the literature include increases in regulated prices (Bonardi et al., 2006; de Figueiredo Jr and Edwards, 2007), favourable decisions on mergers and acquisitions (Holburn and Vanden Bergh, 2014), and government grants or tax concessions (De Figueiredo and Silverman, 2006). These might result in better financial performances in some circumstances (Hadani and Schuler, 2013).

Analogously to economic markets, companies compete in political markets (Baron, 1999). They compete for access to politicians in order to acquire information and deploy strategies of influence with the goal of reducing uncertainty about the outcome of political games and swaying the regulatory process. However, in a political market, firms are not only competing with their market competitors—business associations, trade unions, NGOs, and organisations representing citizens' interests are also part of the demand side in these markets. The literature suggests that large businesses usually prevail over other stakeholders because, facing lower collective action challenges, they are able to diversify strategies and access the highest level of government representatives (Schuler et al., 2002; Baumgartner et al., 2009). Furthermore, in a scenario of rivalry on the demand side, the level of regulatory uncertainty increases (Kingsley et al., 2012) and the effectiveness of corporate political strategies may decrease (Bonardi and Keim, 2005). The current research mainly focuses on competition between producers' and consumers' interests and how the dynamics between them shape policy outcomes. Gawande et al. (2005) showed theoretically and empirically that competing lobbyists cancel each other out and tariffs are lower with more intense competition for policies between upstream and downstream firms. In a model of monetary contribution, Martimort and Semenov (2008) suggested that the presence of competing lobbyists biases the decision towards

the decision-maker's ideal point. Also, Bonardi et al. (2006) showed that firms are less successful in increasing the price of their regulated services when they face competition from interest groups advocating for consumers' interests.

The most common strategies to persuade policy suppliers are lobbying and the financing of electoral campaigns. Baron (2013) defines lobbying as the strategic supply of politically relevant information to government representatives. Firms may choose to deploy these strategies, either individually through their internal departments or by outsourcing to lobbyists to work on their behalf, or collectively through associations. Nevertheless, small firms with limited budgets will usually adopt collective strategies or no political strategy at all (De Figueiredo and Tiller, 2001).

The EU political environment has specific characteristics influencing the deployment of corporate political strategies: in particular, a prohibition on corporate financing of electoral campaigns and the appointment by the Member States of the members of the European Commission. The latter is a central body in the EU policy-making process: It prepares the decisions and bills that are discussed, and potentially amended, in the Parliament and finally adopted by the Council (consisting of the heads of ministries of the Member States). The ban on campaign contributions establishes lobbying as the most important dimension of nonmarket strategy in the EU political arena. The absence of elections influences the incentives of policymakers. In the standard context, the usual political-economy approach is to consider that they are essentially driven by the quest for re-election. In the EU context, Commission members tend to be driven by their ability to show their peers (politicians and top-tier bureaucrats in the system of transnational governance) their ability to fulfil their mandate and establish their legitimacy in being able to navigate the complex political environment of the EU political game characterised by persistent tensions between national (sometimes local) interests and the shared will to build a stronger Union. They are, in a sense, the trustees of the EU and are concerned about their career prospects in the system of power either at the international level or in their home country.

Some research has highlighted the activism of business interests in lobbying EU institutions (Coen, 1998, 2009). One main characteristic of lobbying in the EU is that it is significantly technical and based on the expertise of the interest groups. Their inputs are considered relevant and legitimate to inform the policy-making process (Bouwen, 2002; Mahoney, 2008). Previous research that investigated interest groups' influence in the EU policy-making process gives some clues regarding factors that contribute to successful lobbying. For instance, Hermansson (2016) suggested that recommendations from industry organisations have a greater chance of being accepted, as well as recommendations from stakeholders with specific expertise and privileged access to the European Commission. In this environment, political knowledge about the institutions' governance and the policy-making process, as well as the value of firms' assets and their strategies in the matter of public policies are key to the success of lobbying strategies (Alves, 2019). In addition, the size of the coalition influences policy results (We here use "coalition" to denote a group of stakeholders

targeting the same policy outcome, even if they are not necessarily organised in a formal or ad hoc coalition) (Mahoney, 2007; Klüver, 2011).

The case of wholesale roaming regulation is particularly interesting for a deeper understanding of the organisation of lobbying in the EU because the supplier's motive may change significantly when consumers, basically the voters or those who theoretically grant the authority the mandate, are absent. To better illustrate our idea, we characterise the political market for wholesale roaming as shown in Figure 1. On the demand side, there are many telecommunications operators: Some of them are mobile network operators (MNOs) while others are mobile virtual network operators (MVNOs). Also, some business associations representing niche markets and some specialised consulting companies are active. The policy outcomes they expect are not necessarily in harmony. On the supply side, the European Commission is in charge of the first draft of legislation, called the legislative proposal. Stakeholders interact with the supply side through information exchanges that include both participation in public consultations and other forms of direct lobbying such as private meetings with European Commission representatives. In the next section, we discuss this political market in more detail.

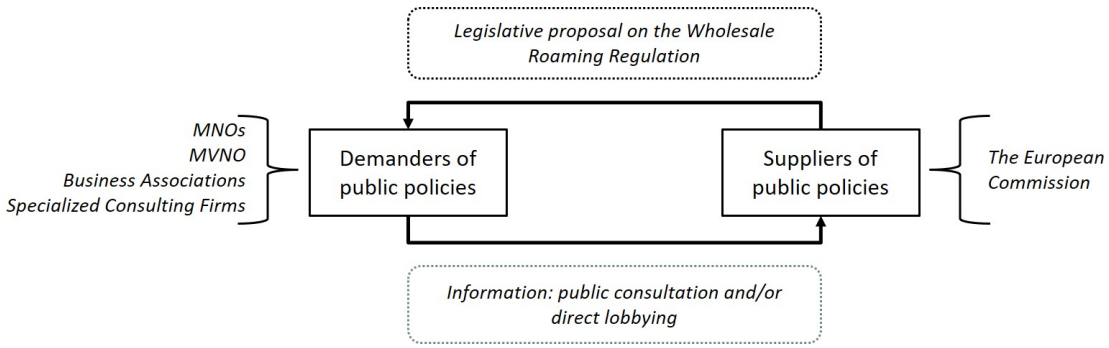

Figure 1: The EU wholesale roaming regulation political market.

3 The Political Market for EU Wholesale Roaming Regulation

In order to understand the main components of this political market, it is worthwhile to introduce the particular context of wholesale roaming regulation. Thus, we start by presenting a brief historical overview of the development of roaming regulation in the EU as well as the main cleavages between policy demanders. We continue the section with considerations about the supply side, the demand side, and how both sides interact during the policy-making process.

3.1 EU roaming regulation in a historical perspective

As a result of an assessment of the roaming market in 2003, the European Commission concluded that roaming charges were excessive and that *ex ante* regulation should be implemented. As a consequence, the *Roaming I* regulation was approved in 2007. It established price caps for intra-EU international roaming covering voice services at both the wholesale and retail levels. This was called the Euro tariff. Further improvements to the regulation occurred subsequently with the implementation of *Roaming II*, which revised the 2007 regulation by lowering price caps for voice services and introducing price caps for SMS on both wholesale and retail charges. Also, it introduced a price cap on data services, but only at the wholesale level. Later, in 2009, *Roaming III* extended the data price cap to the retail market and established a gradual price cap reduction starting in 2014.

These regulations decreased the prices of roaming services significantly. As highlighted by Infante and Vallejo (2012), retail market regulation must be combined with wholesale market regulation to ensure that price drops benefit end users. That was precisely the strategy used in the EU roaming regulation. It is worth mentioning that the supranational structure of the EU was critical to implementing this level of regulation because national regulators have a very limited ability to take measures increasing competition at the international level. Indeed, international roaming prices within the EU did not decline as sharply as prices on each national market (Bourassa et al., 2016).

Although these regulations lessened the burden of roaming charges for EU mobile users, they were not sufficient for achieving the Commission's goal. A necessary step would be the elimination of roaming charges within the Union as proposed by the Commission in 2013. After the agreement of the European Parliament and Council in 2015, new legislation entered into force implementing the RLAH (banning all retail roaming tariffs) from June 2017. This regulation triggered the need for an additional regulation to adapt the wholesale roaming market to the new rules governing the retail market. A summary of the main milestones in the EU roaming regulation is presented in Figure 2.

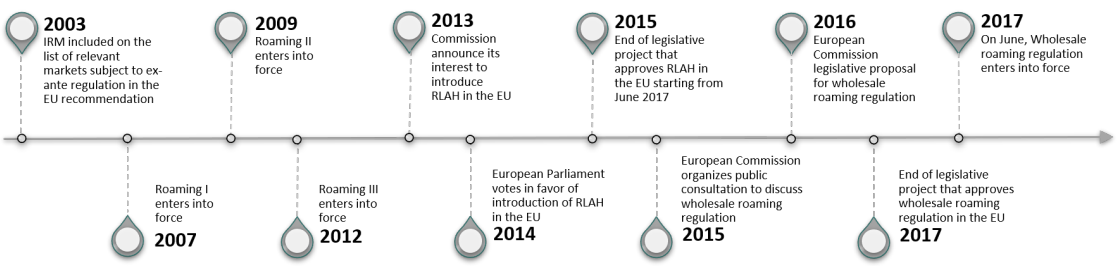

Figure 2: Evolution of Roaming Regulation in the EU.

3.2 The main cleavages

Wholesale roaming regulation is a delicate issue since it has a direct and significant impact on telecommunication companies' operations and revenues. Infante and Vallejo (2012) suggested that roaming revenues in Europe are higher than the global average. Although operators usually do not disclose this information, recent research has estimated these revenues accounted for more than 8% of mobile turnover for Belgium operators (Spruytte et al., 2017).

Therefore, the telecommunications industry was actively interested in the wholesale roaming regulation policy-making process. Among the main issues was implementation of a fair usage policy aimed at preventing distortions of domestic markets and maintaining the sustainability of competition on these markets. An even more contested issue was the level of price caps that would affect the capacity and the maintenance of networks, investment recovery, and businesses' profitability.

Spruytte et al. (2017) aptly presented the main positions of different stakeholders in the international roaming market. We won't repeat the exercise but briefly summarise the arguments. The telecommunications market is populated by service providers with different backgrounds, facilities and market power. A uniform regulation generates winners and losers. First, MNOs and MVNOs are very different service providers. MNOs own their infrastructures, while MVNOs do not own their network and rent services from MNOs. Therefore, MVNOs cannot provide wholesale roaming services to others, and have to pay for it whenever their customers travel to another country and activate roaming. A higher price cap may lead to a higher wholesale price that eventually undermines MVNOs' profits as no retail roaming charges can be charged. Meanwhile, net roaming service buyers are very concerned about the drafting of a fair use policy that prevents users or operators from strategically playing on differences among national retail prices, as abuses of roaming may imply significant operational losses.

Second, the locations where those service providers operate significantly determine the volumes of inflows and outflows of calls and data. Companies operating in hot tourist destinations usually receive a large amount of incoming roaming demands, and are thus very likely to support a high price cap. On the other hand, companies located in countries with net outflows of customers may want a lower price cap. Therefore, the operators' inbound-outbound flow ratio is a crucial determinant of their policy preferences: When it is greater than one, the stakeholder is a net seller of roaming services, and thus has a clear preference for higher caps. EU countries present enormous variations in this indicator. For example, in 2014, the inbound-outbound ratio for data was 42.38 in Croatia, but only 0.34 in the Netherlands (BEREC, 2016).

Third, companies having cross-border networks enjoy a competitive advantage because they can arrange cheap roaming prices by using their own facilities. Moreover, they benefit from greater bargaining power when negotiating wholesale roaming deals with smaller operators.

Fourth, when a regulatory framework is designed, national operators are likely to emphasise their country's specificities and pursue a regulatory outcome that differs from what international operators prefer. Indeed, the latter may value a unified regulatory framework that decreases organizational and compliance costs.

Last, but not least, mobile termination rates (MTR) have a significant weight in the cost of roaming services and may influence companies' preferences. These are voice call termination rates that telecom networks charge each other to deliver calls between networks. In the EU, MTRs are determined by national regulators. Although the Commission issued recommendations in 2009 in the hope of further alignment of MTRs across the EU, the expected harmonisation has not materialised (Commission, 2017). For instance, in 2014, the average MTR varied from €0.40 in Malta to €2.6 in Ireland. As a result, operators in a low MTR country bear high costs to provide roaming services in countries with expensive MTR. Hence, a lower cap would alleviate their roaming costs. More detailed analyses of the factors discussed above can be found in the summary report of the EU public consultation and the one by BEREC (Commission, 2016b; BEREC, 2016).[1] To sum up, as various factors come into play, it can be expected that operators have divergent policy preferences for which they will fight.

3.3 The supply side

The European Commission represents the supply side of this political market. Its primary role is to foster further integration among Member States and its main policy vector is to promote a deeper economic integration through the achievement of a single market. This is the essential mandate given by the Member States, which remain sovereign states with authority over most public policies. The European Commission is thus a nonstandard political actor for which promoting competition is almost a constitutional commitment [e.g. Wilks (2015)], and eliminating distortions on each and across national markets is a strong driver of its policy, which is therefore characterised by free market principles.

Building a single EU market is not the Commission's only concern. Since Commissioners are appointed by each national government, and are therefore not directly accountable to EU citizens, the Commission needs to establish its legitimacy, which strongly depends on the view of EU stakeholders about its performance. Hence, it attempts to involve the latter in the policy-making process.

Of course, to re-balance the relationship with national governments, the Commission also attempts to curry the public's favour by showing the citizens the gains from European integration.

[1] BEREC is the Body of European Regulators for Electronic Communications responsible for assisting the Commission and the national regulatory authorities (NRAs) in implementing the EU regulatory framework for electronic communications.

When Jean-Claude Juncker was appointed President of the European Commission in 2014, he established the development of the Digital Single Market as a priority of its mandate. This included the elimination of roaming surcharges. When the abolition of roaming charges at the retail level was confirmed, the need for a new wholesale market regulation emerged.

The Commission already had some clues on the functioning of the roaming market from an assessment performed in 2011. This report highlighted some noncompetitive features of the wholesale roaming market, including an oligopolistic character and the bilateral nature of the agreements (Commission, 2011). To update its information and prepare the new regulation, and to get inputs from interested parties, the Commission involved the main stakeholders in the policy-making process. Besides counting on the participation of the main impacted stakeholders (MNOs and MVNOs), the Commission also consulted BEREC and requested coordination with the national regulatory agencies to collect market data.

The central challenge for the Commission was to balance the new price cap. On the one hand, it should be sufficiently low to allow a sustainable implementation of RLAH, to promote competition, and to avoid retail price increases. On the other hand, it should be high enough to allow cost recovery and a return on investments to visited network operators while safeguarding MVNO competition in the visited markets (BEREC, 2016).

It is worth emphasising that the European Commission is not the only institution responsible for EU policy-making. A legislative proposal of the Commission only enters into force after the approval of the European Parliament and the Council of the EU. However, until release of the first draft, the Commission has full autonomy to design policies. On top of that, there is little transparency in the participation of stakeholders in the subsequent stages of the policy-making process. Thus, this research investigates the making of wholesale roaming regulation until publication of the first draft by the European Commission and does not include the other EU institutions on the supply side.

3.4 The demand side

Given that the rules at the retail level were fixed, the actors of the telecommunications industry are the main representatives of the demand side of the EU wholesale roaming political market. As mentioned before, this includes the two types of operators, MNOs and MVNOs, some specialised consulting firms, and sectoral business associations.

Three to four MNOs are operating in each of the 28 EU countries. However, some of them operate in several EU countries, resulting in a total number of MNOs in the EU to approximately 39. The MVNO market is less concentrated than the MNO one. According to a report from GSMA, two-thirds of MVNOs worldwide are located in Europe, which represents 585 virtual operators (Dewar,

2015). Not all operators participated in the policy-making process, according to the report of the Commission, there were only 32 MNOs and 8 MVNOs. The low rate of participation of MVNOs was not surprising. Considering that most of them are relatively small firms, they have fewer resources to invest in political activities. While it is free to participate in the EU public consultation, the participants still need to make some effort to analyse the questions and support their arguments with evidence. This can be demanding for small players. Among the MNOs, the participation rate was high and included the largest EU firms in the sector. Those that did not participate were some of the smaller ones.

In Figure 3, we provide a summary of all private stakeholders whose contributions to the policy-making process were publicly available. There are 34 operators, including MNOs and MVNOs, four consulting companies, and five business associations. For the operators, we identify all the countries they operate and their country of origin represented by "X". The consulting companies are identified according to their home country, but we do not know if they work for any operators. The associations represent the interest of the sector and, more specifically, of their members. We thus identify the companies that have membership in some of the participating associations. Among the participating associations, there is AMETIC, a national association that advocates for the technology market in Spain. ECTA, ETNO, and MVNO Europe are EU associations. ECTA represents the interests of new market entrants. ETNO represents Europe's telecommunication network operators, most of its members are incumbents. MVNO Europe, as implied by its name, aggregates MVNO companies. GSMA is an international association of companies in the mobile communications industry.

Among the participants, there are eight operators (1 MVNO and 7 MNOs) that did not authorise the disclosure of their position, and, thus, they were not included in Figure 3. From the report issued by the European Commission, the Austrian operator A1 Telekom and the Spanish operator Telefonica are part of the stakeholders that preferred to keep their opinions confidential.

3.5 The interplay between the demand and supply side

In order to understand all the constraints and possible consequences of the new regulation, the European Commission launched the *Public consultation on the review of national wholesale roaming markets, fair use policy and the sustainability mechanism referred to in the Roaming Regulation 531/2012 as amended by Regulation 2015/2120* from November 26, 2015 to February 18, 2016. It was the main public channel of information exchange between the Commission and the stakeholders interested in this regulation. As described in the demand side section, it collected 51 replies from stakeholders in 25 EU countries and Norway. However, only 43 of them allowed their positions to be released. Views were divided, as the Summary Report concluded.

ID		Associations					EU Countries List																										
Companies	**Role**	**AMETIC**	**ECTA**	**ETNO**	**MVNO EU**	**GSMA**	**AT**	**BE**	**BG**	**HR**	**CY**	**CZ**	**DK**	**EE**	**FI**	**FR**	**DE**	**EL**	**HU**	**IE**	**IT**	**LV**	**LT**	**LU**	**MT**	**NL**	**PL**	**PT**	**RO**	**SK**	**SI**	**ES**	**SE**	**UK**
aero 2 sp z o.o.	MNO																										X							
Bite Lietuva	MNO																						X											
Bouygues Europe	MNO															X																		
Cyfrowy Polsat S.A.	MVNO																										X							
Deutsche Telekom AG	MNO																X																	
Drillisch AG	MVNO																X																	
eircom Ltd/Meteor Mobile	MNO																			X														
Elisa Coporation	MNO														X																			
POST Luxembourg	MNO																							X										
CETIN	Network											X																						
Fastweb S.p.A	MVNO																				X													
Free Mobile	MNO															X																		
Hutchison Europe	MNO																																	
Liberty Global B.V.	MVNO																									X								
Max Telecom OOD	MNO								X																									
Melita plc	MNO																								X									
NOS comunicações, S.A.	MNO																											X						
Numericable - SFR	MNO															X																		
O2 Czech Republic a.a	MNO											X																						
ORANGE	MNO															X																		
Polkomtel Sp. Z o.o.	MNO																										X							
Proximus SA	MNO							X																										
PT Portugal SGPS	MNO																											X						
TDC Group	MNO												X																					
Tele2 AB	MNO																																X	
Telecom Italia SpA	MNO																				X													
Telenor	MNO																																	
TeliaSonera AB	MNO																																X	
TRANSATEL	MVNO															X																		
United Internet AG	MVNO																X																	
Versatel GmbH	MVNO																X																	
Vivacom (BG)	MNO								X																									
Vodafone	MNO																																	X
WIND Hellas	MNO																	X																
eutema GmbH	Consulting																																	
Mobileum Inc.	Consulting																																	
QSC AG	Consulting																																	
Sciamus Kft.	Consulting																																	
Association Level:		**Spain**	**EU**	**EU**	**EU**	**World**																												

Figure 3: Stakeholders Map.

In the public consultation stakeholders are encouraged to disclose their real position, because the information they provide is an essential tool for the Commission to understand and acknowledge the preferences of the stakeholders. The public consultation is an important channel for private stakeholders to have their voices heard at the European level due to its transparency and low cost. Moreover, it is essential for stakeholders to clearly express their arguments in such a formal process, since *ex post* the Commission and its officers can rely on these publicly expressed opinions to justify their proposal. Most of the material in this paper—i.e. information on the stakeholders' interests and their main arguments—is from the responses to this public consultation.

However, the various parties have other opportunities to share their views with the Commission, including bilateral meetings with the commissioners and specialised workshops organised by the Commission. Usually, firms and associations organise bilateral meetings with commissioners or members of their cabinets to directly lobby policymakers, which may increase their chance of influencing the policy-making process. During the period between release of the public consultation and publication of the legislative proposal, representatives of the European Commission had more than one hundred meetings with stakeholders of the telecommunication sector. However, access to them is not balanced. While Deutsche Telekom, Orange, Vodafone, and ETNO met with a commissioner representative more than ten times in this period, other stakeholders had no meetings with them.[2]

[2]This information is available on the web page of each commissioner. We checked the pages of the 28 commissioners during the period to calculate the total number of meetings with the telecommunications sector' stakeholders.

For the preparation of this regulation, the Commission also organised a dedicated workshop to discuss the model that was used to assess the impact of the new regulation. The workshop occurred on 28 January 2016; i.e. during the period of the public consultation. For this occasion, the Commission invited BEREC, national regulatory agencies, firms, and associations of the telecommunications sector to inform them of the main characteristics of the model, and to elicit their feedback. The benefits of participating in this type of workshop are twofold. First, stakeholders obtain information that is important for elaborating their positions in the public consultation. Second, they have the opportunity to opine on the rules of the model that can lead to outputs more aligned to their interests. We did not have access to detailed information on the workshop but, from the final report of the consulting company in charge of assessing the market, we were able identify some of the participants representing the private sector: Deutsche Telekom, Free, Orange, Proximus, TDC, Telecom Italia, Telefonica, Telenor, Telia Sonera, and Vodafone (TERA-Consultants, 2016).

The legislative proposal presented by the European Commission after the consultation process did not establish specific rules for the fair use policy, claiming instead that the roaming regulation in force allows operators to include conditions in their reference offer for wholesale roaming to prevent permanent roaming and other abuses. Nevertheless, the Commission proposed an EU-wide cap at a lower level than the previous legislation. Such a decision, at first sight, has a positive impact on operators with high roaming costs and low bargaining power. This paper is going to investigate the following. First, we are interested in the main points or arguments raised by the stakeholders. The result will help us understand their main concerns, which also points to the main cleavages in the industry. This investigation is done with the technique of topic modelling. Second, by comparing stakeholders' preferences with the Commission's choices, we check for factors that might explain the alignment, which could also be interpreted as lobbying success. We rely on regressions to disentangle effects of multiple variables as well as on qualitative text analysis to complement the interpretation of the results.

4 General Assessment of the Demanders by their Textual Inputs

The essence of the public consultation is the textual information provided by the stakeholders, who are the demanders of the policy. We propose a general assessment of the information by topic modelling. Ideally, the technique gives us a mapping or clustering of stakeholders according to what they wrote in their responses to the consultation. Clustering allows us to identify the main dimensions of debates on wholesale roaming regulation and also stakeholder clusters that adopted similar lines of reasoning.

4.1 Topic modelling: a brief introduction

We will only briefly discuss the technique and the objective of applying topic modelling. Most of the details are provided in the Appendix. Topic modelling is a technique to identify "topics" dealt with in "documents", and a topic is broadly identified through the co-occurrences of terms. In this work, we adopt the Latent Dirichlet Allocation (LDA) topic modelling (Blei et al., 2002) approach, which assumes sparse Dirichlet prior distributions over document-topic and topic-word distributions and relies on the assumption that documents contain a limited number of topics and that topics are characterised by a small number of words. The algorithm provides us with the words associated with each cluster of co-occurring terms (topics) and their respective salience, as well as documents' probabilities of each cluster/topic. In other words, the result allows identification of the prevalent issues debated in the public consultation and also the clusters of stakeholders sharing similar opinions about the questions raised by the Commission.

The results presented below are based on the assumption that the number of topics is two. The choice of this number is discretionary and its relevance can only be evaluated or justified *ex post*. We appealed to our intuition and compared alternatives and concluded that the results with two topics was the most interpretable.[3]

4.2 Topic modelling: results

We first present the clusters of stakeholders before moving on to the topics. In Figure 4, we rank the probability of belonging to Cluster 1, p_1, from lowest to the highest.[4] As there are only two topics, the probability of belonging to Cluster 2 is $1-p_1$. In other words, any stakeholder for whom $p_1 < 0.5$ belongs to Cluster 2 according to the topic modelling result. An obvious observation is that MVNOs and small MNOs cluster together, where we find, for example, Fastweb from Italy, Drillisch from Germany and the Association MVNO EU, while the other side is mainly populated by MNOs, including Vodafone, Orange, and Deutsche Telecom.

The more salient and distinguishable terms characterising each cluster or topic are listed in Table 1. Also, we present some extracts of the replies to contextualise how these terms are employed. Cluster 1 is dominated by terms related to fair use policy and permanent roaming. The absence of a fair use policy would increase the risk of abuse of roaming in an RLAH environment. As retail service fees across countries are still far from being harmonised, abuses of roaming could lead to unwanted distortions that would trigger increases both in retail prices and wholesale roaming costs. In this scenario, roaming costs under RLAH would make the operations of MVNOs, who are net roaming service buyers, and small MNOs economically unsustainable because of their lack

[3] We tried with 3, 4 and 5 topics, but failed to clearly and consistently interpret the topics.

[4] There was no text available in the contributions of Max Telecom and Ametic. They only answered the multiple choice questions. Therefore, they are not included in the topic modelling analysis.

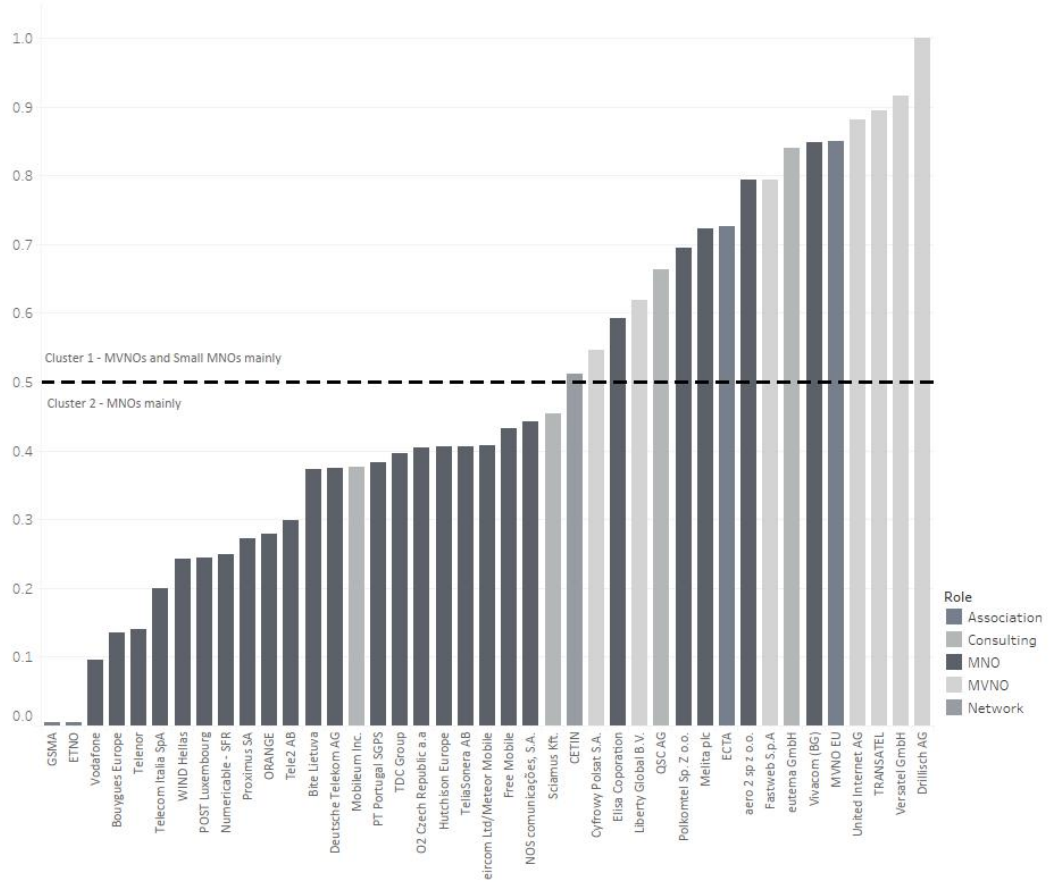

Figure 4: Topic modelling Clusters. The score on the y-axis is the probability that the stakeholder belongs to Cluster 1. Since there are only two clusters, the probability of belonging to Cluster 2 is one minus the score.

of bargaining power to negotiate competitive rates with large operators. Furthermore, MVNOs usually need to pay visited operators for additional services due to their virtual structure, resulting in a roaming cost exceeding the caps. Therefore, for these operators, fair use policy rules are essential in the design of the new regulation.

On the other hand, Cluster 2 is dominated by terms related to prices. The larger MNOs are more sensitive to price changes than to the fair use policy design. While they are also subject to distortions in the domestic market, they are partially protected by their size. However, price represents a main concern. Net receivers wanted to secure their roaming revenues, arguing that prices are already low and competitive, while net senders defended lower prices that could improve their competitiveness. In any case, wholesale roaming prices impact on their operations due to the size of their portfolios of subscribers.

The result shows that the "MNOs vs. MVNOs" cleavage is robust, and the two groups approach their informational lobbying on different grounds. While stakeholders were delivering different messages to the Commission, we identify and summarise two clusters of messages. However, this does not tell us anything about the alignment of the stakeholders' preferences with those of the Commission. A more in-depth and precise investigation of the responses and options preferred by the players on the demand side is needed. We therefore investigate the alignments of preferences on specific issues of this regulation.

	Cluster 1 Predominantly MVNOs and Small MNOs	**Cluster 2** Predominantly MNOs
Words	Fair_use , year, perman_roam , travel, sustain, fair-usage-policy	Charg , rate, wholesal_cap, mobile-network-operator, price_cap, retail_price
Extracts	**Transatel:** "The fair use policy should only cover the periodic roaming, i.e. occasional roaming, such as the one we have highlighted above. All the other areas should not be covered by the fair use policy because they are not periodic roaming ... " **Drillisch:** "We consider "periodic travel" to mean a maximum of a two-week annual vacation taken by an average EU citizen. Wealthy citizens travelling through the Union on a weekly basis or even several weeks at a time should not be taken into account. We even assume that average EU citizens spent less than two weeks in another EU Member State..."	**ETNO:** "... commercially negotiated prices are currently the norm for wholesale roaming and market prices are much below the regulated price caps, especially for data .. " **Bouygues:** " Competition both on price and quality should remain the main driver on the wholesale market. Decreasing wholesale price caps will have adverse effects... "

Table 1: Summary of topics.

5 Investigation of Alignments on Specific Issues

The Public Consultation contains 77 questions in total. The covered issues are much broader than those dealt with in the bill on wholesale roaming markets. We focus on four questions specific to particular aspects of the new proposal that are relevant to the desired change to the policy instrument to implement RLAH without substantially interfering with the retail market.[5] We take the options chosen by stakeholders in the multiple choice questions and match them with the option taken by the Commission to construct a measure of alignment on each question. Such a measure can be interpreted in two ways. First, it is a measure of alignment indicating that the stakeholder's preference is also the option chosen by the Commission. Second, it could be a measure of lobbying success that allows us to infer causality from lobbying efforts to outcomes. We provide the information in Figure 5, where a dark grey cell refers to the alignment between the stakeholder and the Commission, a white cell represents the opposite, and a light grey cell refers to "neutral" or "don't know".

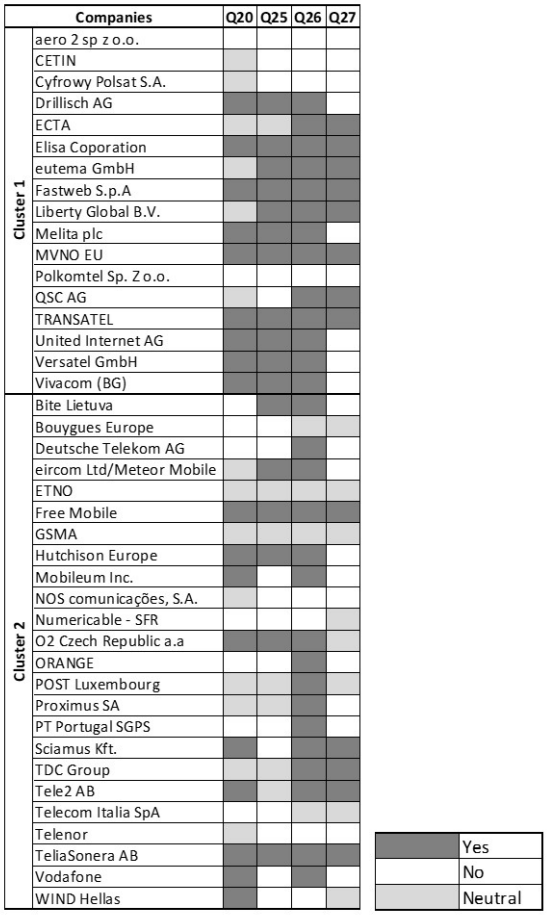

Figure 5: Alignments between the Stakeholders and the European Commission.

[5] We state and briefly explain the four questions in the Appendix.

Stakeholders within a cluster do disagree with each other on some policy issues. This suggests intense policy competition even within a cluster. For instance, although MVNOs are more concerned with fair use policy, they lobby for different outcomes on other policy issues.

To understand the reasons behind policy preferences, we have recourse to multivariate regressions. We employ a Probit model, where the dependent variable is the binary measure that is one if the position chosen by the stakeholder is the same as the Commission's, and zero otherwise. In the following analysis, the state of sharing the same position or option is referred as *alignment*. This relatively neutral term is chosen deliberately to maintain prudence in our interpretation of the following results. We do not argue that an alignment is due to the lobbying effort of the stakeholder. It could well be possible that the Commission already had a predetermined position and that for some reason some stakeholders aligned with the Commission. Nevertheless, we do not rule out the possibility that lobbying efforts could positively impact on lobbying success.

Due to the small sample size, we select our explanatory variables carefully based on the literature and the debates concerning the cleavages of the wholesale roaming market. We categorise three types of factors, and each of them contains only two variables. The first type is the company's characteristics, which include the type of stakeholder (MNO or MVNO) and the size of the company measured by the total assets.[6] The second type is operational characteristics which include the number of subscribers and the inbound-outbound ratio.[7] The inbound-outbound ratio is weighted by the numbers of subscribers in the countries of operation. The final type is lobbying efforts, measured by an aggregate lobbying measure and information quality. The aggregate lobbying measure is a composite index composed of four elements: number of meetings, experience (proxied by the length of time registered in the EU Transparency Register), number of full-time employees on lobbying, and lobbying expenditure.[8] Each of the components is normalised to a scale from 0 to 1 and an average score is computed. Constructing a composite index reduces the number of variables, and lessens the problem of measurement errors. For instance, lobbying expenditure is coded as a categorical variable in the original dataset, and the Commission has not verified its truthfulness. Information quality is measured by the number of unique terms used in the reply to the public consultation. In the following regressions, we first include one type of variable and then two types at one time, limiting the number of explanatory variables to at most five (including a constant).

[6]Total asset information was obtained from the Orbis database for the year 2015.

[7]Numbers of subscribers are available in BEREC report on termination rates (BEREC, 2015) and termination rates are available in the BEREC report on the wholesale roaming market (BEREC, 2016). Note that the inbound-outbound ratio is only available for MNOs.

[8]Information about experience, expenditures and employees were extracted from the Transparency Register (http://ec.europa.eu/transparencyregister/public/homePage.do?redir=falselocale=en)—the EU lobbying register. Information from meetings was collected from the Commissioners' official webpages during the period 01/11/2015 and 15/06/2016. It includes some days before the Public Consultation was issued until the day when the legislative proposal was submitted.

In the following subsections we discuss the results of the four questions, shown in Tables 2, 3, 4 and 5, one by one. The specifications of the regressions are kept the same throughout. The first column includes company characteristics only, the second column operational characteristics only, and the third column lobbying efforts only. Columns 4–6 include combinations of them. Being aware of the limitation of our multivariate approach due to the smallness of the sample, we complement the interpretations of the results with a qualitative analysis of the stakeholders' inputs.

5.1 Question 20 - The need for regulation

Question 20, in short, asks whether the subject agrees that RLAH could be implemented without any regulations and specifies that the Commission's position is "No". Refering to Table 2, apart from the inbound-outbound ratio, no variable is significant. A larger than one inbound-outbound ratio means that the operator is a net receiver. A positive coefficient suggests that it tends to prefer having regulations, which is also the position taken by the Commission. Column (4) includes both company and operational characteristics. The number of subscribers is significant at the 10% level. Column (5) includes both company characteristics and lobbying efforts, where no variable is significant. Column (6) includes both operational and lobbying efforts. The inbound-outbound ratio remains significant. In contrast to what the literature suggests and people may think, we find no evidence supporting any positive effect of lobbying on policy outcome.

While the multivariate regression identifies that inbound-outbound ratios tend to influence the view of the stakeholders, analysis of the consultation replies suggest that bargaining power of operators in determining the wholesale roaming price is one of the determinants of their positions in the matter of regulation. On the one hand, some operators argue that prices are already competitive, and no further regulation is necessary. This group includes some large operators. It is consistent with the negative sign of total assets in the regression results. On the other hand, other operators consider that it would be very tough to negotiate wholesale prices to make RLAH sustainable in the absence of regulation. We can depict the tension between these two sides through their responses. For example, Melita, a small operator from Malta wrote: *"The wholesale roaming costs should be dropped down especially for small networks that are not part of an alliance."* This suggests that operators out of an alliance occupy a weaker position in negotiations of wholesale roaming prices. However, participants in alliances do not recognise that being in an alliance helps them obtain better prices outside the alliance. Telecom Italia, an Italian operator with a worldwide footprint, wrote: *"The Alliance doesn't directly negotiate roaming terms with other groups or alliances; outside the alliance, all negotiations are carried out by each operator separately."* Also, Orange, which operates in seven EU countries wrote: *"The wholesale roaming business is not a topic discussed by the Alliance."* Judging by what they have written, being in an alliance does not improve their position when dealing with other operators.

These same operators that participate in alliances believe that the market works fine and no regulation is required. In its reply to the question, Orange affirmed: *"This means that wholesale roaming regulation is justified only insofar as it addresses problems with competition on this market. If it can be shown that the wholesale roaming markets are currently competitive, there is no justification for regulating wholesale roaming."* This view is also shared by Telecom Italia, which wrote: *"Price wise, the wholesale market is dynamic and accessing suitable conditions has never been an issue. We don't expect this to change because of RLAH and we believe that creating a suitable wholesale basis for RLAH won't be problematic."*

Nevertheless, negotiation issues were also underlined by other operators such as Free, a French operator: *"Our experience shows that whilst it was easy to negotiate the first year of RLAH, when the amount traffic exploded, negotiations are becoming more difficult each year as the increment of volume declines over time."* Verstatel, an MVNO from Germany, also highlighted its vulnerability in roaming negotiations: *"If there is no regulated intervention at all and wholesale roaming prices are not reduced to their domestic wholesale level, international MNOs will misuse their market power over smaller mobile service providers. Consequently, smaller mobile service providers, MVNOs and SPs, will not survive in the mobile telecommunication market."*

Regulation seems to be necessary for players with less bargaining power to ensure that they pay no more than a capped maximum for the wholesale roaming service. Thence, only operators with a strong bargaining position prefer an unregulated market. Two characteristics increase the ability of operators to set favourable bilateral agreements: the quality of the network and the ability to organise alliances in the sector. Acknowledging these factors and analysing some market facts provides a straightforward explanation for the motivations of the stakeholders that prefer an unregulated market. Telecom Italia, Orange, and Deutsche Telekom are members of the Freemove Alliance, the main goal of which is to enhance the quality of international mobile services.[9] SFR has a partner market agreement with Vodafone.[10] Bouygues has no specific roaming alliance, but it is a player with a great capacity to collaborate with other players in the sector. For example, it is a founding member of the LoRa alliance for the development of the internet of things, of which other European operators such as KPN and Proximus are also members.[11] Also, it has entered a partnership with Telefonica to provide business solutions in France.[12] Although these alliances are not related to roaming, they may also facilitate the development of better roaming negotiations. For other operators such as Polkomtel and PT Portugal, the quality of the network provides their competitive edge. When an operator has superior coverage of the territory, foreign operators can

[9] Freemove Alliance's website accessed in June 2019: https://www.freemove.com/

[10] Communication on the renewal of the market agreement between SFR and Vodafone accessed in June 2019: https://www.vodafone.com/content/index/what/partner-markets/news-pages/sfr-renew.html

[11] Bouygues press release accessed in June 2019: http://www.bouygues.com/wp-content/uploads/2015/11/11-06_alerte_presse_quatre_operateurs_deploient_des_reseaux_lora.pdf.

[12] Article in Les Echos newspaper accessed in June 2019: https://www.lesechos.fr/2016/06/lalliance-bouygues-telefonica-porte-ses-premiers-fruits-222632.

hardly avoid coming to an agreement with it because they need to ensure their clients will not lack service availability while roaming.

In summary, the regressions of question 20 show a tendency of alignment between net receiver operators and the European Commission in agreement on the importance of regulation to ensure the functioning of this market. At first sight, this result may appear counter-intuitive, but it seems to be driven by some small firms that, despite operating in net receiving countries, lack bargaining power. That is the case, for example, of Wind Hellas in Greece, Vivacom in Bulgaria, Melita in Malta. We note through a qualitative analysis of the replies to this question that a lack of negotiation power is one of their main motivations for advocating regulation in the wholesale roaming market. Indeed, most MVNOs and small operators, who occupy a weak negotiating position, claim that regulation is needed for the good functioning of the market while operators in a strong negotiation position defend the opposite position. We also highlight that more than one-third of participants had a neutral position in this question. This includes all the business associations except MVNO EU.

5.2 Question 25 - The level of the price cap

Question 25 is the core of this public consultation. Stakeholders were asked to choose among lifting, maintaining, and lowering the price cap so that the new regulation would facilitate the implementation of RLAH. We know, *ex post*, that the Commission proposed a reduction of the cap. Refering to Table 3 we see that, generally speaking, company characteristics do not robustly explain positions. The number of subscribers and the inbound-outbound ratio are negatively related to the preference for lower caps. Meanwhile, those providing more information tend to be the "losers" in terms of alignment with the Commission's decision. This suggests that either the provided information was not useful and thus ignored, or the Commission chose not to accommodate them. A more convincing explanation is that those potential losers were aware of the Commission's intent to lower the caps, and were thus very eager to provide arguments to attempt to reverse its decision. In any case, lobbying efforts failed.

The analysis of responses is consistent with the results of the regression. The preference for a lower price cap is usually the choice of MVNOs and small MNOs who lack bargaining power and some international MNOs who, despite their large size, are net senders in the wholesale roaming market. Their main argument for a lower price cap is that a sustainable RLAH depends on a lower cap to prevent shifting the cost to the retail market. For example, the Danish operator TDC wrote: *"Low caps will provide safety against operators that have no incentive to lower wholesale prices to support RLAH for home operators."* Also Liberty Global wrote: *"The best way to mitigate against any potential domestic price increases would be to reduce wholesale roaming charges significantly."*

The preference for other options, such as lifting any price regulation or keeping the current price, is shared among large operators and some small ones who operate in countries with high seasonal roaming demand. Small operators' concerns centre on their ability to recover their network investments. For instance, Wind Hellas, a Greek operator, opted for lifting price regulation. In reference to the time when there was no wholesale roaming regulation, it wrote: *"Rates were sufficient to allow discount negotiations and also to cover all related costs and allow investments."* Moreover, NOS Comunicações, a Portuguese operator, opted for an alternative solution: *"However, in net receiving (and highly seasonal) destinations such as Portugal, the networks need to invest massively to deliver the roaming service . . . revision of the current wholesale price caps by ensuring a methodology that will take into account each country's idiosyncrasies."*

The large operators mainly used the prevention of permanent roaming to justify their preference for keeping current prices or lifting price regulations. For instance, Deutsche Telekom wrote: *"Today the commercial differences between the national wholesale price level (i.e., for MVNOs) and the international wholesale price level (i.e., roaming) is sustainable protection against uncontrollable market entry via 'permanent roaming'."* Orange's reply follows the same line of argumentation: *"Wholesale caps are used as a safeguard against fraud or non-compliance with contract terms. This is why it is important to maintain wholesale caps at a sufficiently high level above market prices."*

The replies to question 25 about the levels of price caps probably provide the clearest evidence for the cleavage between operators and how they are pursuing their individual interests. At first, we call attention to the fact that no operator was neutral to this question while some business associations, including ETNO, ECTA, and GSMA, decided to remain neutral. Furthermore, the regression results align with the qualitative assessment of the replies. While MVNOs clamour for a lower cap, MNOs are divided. Usually, the operators that obtain significant revenues from roaming services lobby against a lower cap to protect their rents. It is worthwhile to note that not only the roaming regulation but also other competitive measures implemented by the European Commission decreased the revenues of the main EU operators in recent years (Dewar, 2015). Thus, additional revenue losses would negatively impact their performance and deter investments required to deploy their market strategies.

5.3 Question 26 - Setting the price cap: EU wide vs. country-specific

Question 26 asks whether regulation should be implemented uniformly at the EU-level or heterogeneously at the national level. Only the aggregate lobbying score appears to be a significant variable, which is positively related to the preference for EU-wide regulation. This result is not surprising since stakeholders who have been intensively lobbying tend to operate over different countries and be more sensitised to the EU political environment.

A closer look into the data corroborate the regression result that the stakeholders who lobbied intensively are favourable to regulation implemented at the EU level. Vodafone, Orange, and Deutsche Telekom had more than 15 meetings with Commissioners and members of their cabinets during the period of the discussion of the wholesale roaming regulation. They are favourable to an EU wholesale roaming cap. Not only these MNOs with a large EU footprint preferred this option but also MVNOs. It is not difficult to understand that EU-wide caps would reduce transaction costs and favour their expansions into other EU countries. On this, Telia Sonera, which operates in Nordic and Baltic countries, wrote: *"Any differences in cost between EU countries makes business planning and decisions even more difficult for operators."* Another example is the Italian MVNO Fastweb: *"Moreover, differentiation of wholesale caps for each Member State could force operators into complex consumer unfriendly retail pricing structures and usage restrictions. This seems difficult to reconcile with the political objective of the elimination of retail roaming surcharges."*

However, companies that operate in a single country tend to highlight their country specificities to have a regulation that fits into their characteristics. For example, Wind Hellas wrote about its ideal price cap: *"Country Specific and also per operator approach since Groups do not have the same costs. Groups benefit from the traffic maintained within the Group, eliminating costs, without impacting their wholesale margins, as revenues are 'kept' within the Group."* Also, Cyfrowy Polsat tried to defend a specific cap: *"If domestic retail prices (which are of major importance to the average consumer) and domestic wholesale prices (which reflect costs of providing mobile communications services) vary to such an extent between EU countries, how can one EU wholesale price for roaming services be justified and fair?"*

This question presented the highest percentage of alignment between participants in the public consultation and the European Commission. An EU-wide cap is preferred by 70% of them. All the operators that preferred a country-specific cap are single-country operators that are either not registered for EU lobbying or invest little in lobbying activities.

5.4 Question 27 - Setting the price cap: efficient operator vs. actual costs

Question 27 addresses the baseline for the calculation of costs. The Commission has chosen to compute the costs based on a theoretical efficient operator, instead of actual operators. We find some evidence that the abundance of information provided is negatively correlated with lobbying success. Again, we do not expect information to have a negative impact, but the expectation that the Commission had a predetermined position in mind induced stakeholders to provide more information.

A preference for basing costs calculations on a hypothetical efficient operator seems to prevail among operators from net sender countries such as Elisa, TDC, and Tele2, which mainly operate in Nordic and Baltic countries. This preference is also shared with the majority of sectorial consulting companies and some MVNOs such as Fastweb, Liberty, and Transatel. Their responses were, however, brief. According to them, efficient-operator is the solution most conducive to attaining RLAH. For example, Telia Sonera wrote: *"Since the retail roaming regulation (RLAH) is based on the assumption that providing roaming services costs the same as providing domestic services, this needs to be reflected in wholesale roaming caps, hence they should be based on a hypothetical efficient operator."* In addition, MVNO EU wrote: *"The aim of the regulation is to compensate for the lack of efficiency in price setting resulting from lack of competition. Modelling a hypothetical efficient operator is consistent with this aim."*

The analysis also reveals some operators' fear that a model-based cap would not cover the real costs of operators. As a result, many operators preferred to defend a model based on actual costs or even to criticise the weakness of a model-based solution. For example, the Baltic operator Bite Lietuva explained its disagreement with a cap based on an efficient operator: *"Using the costs of a hypothetical efficient operator might yield situations for some operators in which it might be not sustainable to provide wholesale roaming services."* Furthermore, the Portuguese operator PT Portugal talked about its preference for a model based on actual costs: *"Actual costs should be considered, including all the costs associated with service provision, such as carrier traffic transportation, IPX, GRX, and signalling, among others."* Also, according to Orange: *"Therefore, any cost modelling used to control the requirement of cost recovery must reflect the actual cost function derived from actual technical solutions of actual operators."* The position of Deutsche Telekom is against a model-based approach to set the cap: *"A regulated wholesale roaming price cap must cover all relevant costs but must not be set on a cost model or cost estimates. Any cost-estimate can only serve as a reference point and provide a range of expected average costs."*

In question 27, it is hard to identify a pattern that could explain policy preferences. Neither the quantitative nor the qualitative analysis point towards a characteristic that is consistent enough to interpret the policy choices. Also, this is the question that occasioned the most divergence among participants. The preferred option among stakeholders, the efficient operator option, received almost the same level of support as the other available options. However, most of the operators that supported the efficient operator option also supported a lower price cap, which is reasonably consistent. Considering the model parametrisation, the use of a hypothetical efficient operator tends to give a lower estimate of the costs of providing roaming services than the use of a model based on actual costs.

Table 2: Q20

	(1)	(2)	(3)	(4)	(5)	(6)
MVNO	0.855				0.824	
	(0.563)				(0.592)	
log Total Assets	-0.078			-0.608*	-0.141	
	(0.115)			(0.311)	(0.186)	
log Subscriber		0.037		0.712*		0.563*
		(0.161)		(0.364)		(0.315)
In-outbound ratio		0.840**		1.219*		1.123*
		(0.388)		(0.646)		(0.582)
agg lobbying			-0.778		0.543	-1.899
			(1.350)		(1.811)	(2.001)
ln length			-0.398		-0.422	-1.520*
			(0.510)		(0.522)	(0.809)
Constant	0.914	-1.803	3.231	-3.245	5.212	2.041
	(1.803)	(2.780)	(3.962)	(3.351)	(4.615)	(5.534)
N	33	24	32	24	32	24
R-squared	0.065	0.091	0.037	0.205	0.097	0.264

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 3: Q25

	(1)	(2)	(3)	(4)	(5)	(6)
MVNO	0.926				1.096	
	(0.703)				(0.699)	
log Total Assets	-0.237**			0.038	-0.118	
	(0.113)			(0.284)	(0.180)	
log Subscriber		-0.811***		-0.860**		-0.914**
		(0.253)		(0.392)		(0.441)
in-outbound ratio		-0.996**		-1.004**		-1.394**
		(0.429)		(0.431)		(0.585)
agg lobbying			-1.054		0.467	2.274
			(1.364)		(1.536)	(2.898)
ln length			-1.081**		-1.233**	-1.431*
			(0.527)		(0.497)	(0.864)
Constant	3.794**	14.185***	9.073**	14.368***	11.660**	27.443***
	(1.819)	(4.326)	(4.103)	(4.295)	(4.596)	(9.845)
N	33	24	32	24	32	24
R-squared	0.148	0.371	0.155	0.371	0.232	0.467

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Q26

	(1)	(2)	(3)	(4)	(5)	(6)
MVNO	0.557				0.890	
	(0.649)				(0.665)	
log Total Assets	-0.023			0.119	-0.179	
	(0.108)			(0.254)	(0.189)	
log Subscriber		-0.224		-0.351		-0.719**
		(0.166)		(0.272)		(0.306)
in-outbound ratio		-0.476		-0.483		-0.875**
		(0.419)		(0.398)		(0.427)
agg lobbying			1.717		3.593**	5.004**
			(1.410)		(1.755)	(2.486)
ln length			-0.472		-0.558	-0.374
			(0.480)		(0.473)	(0.719)
Constant	0.858	4.704	4.062	4.825*	7.089*	15.085**
	(1.707)	(2.875)	(3.720)	(2.809)	(4.213)	(6.394)
N	33	24	32	24	32	24
R-squared	0.023	0.065	0.042	0.071	0.108	0.226

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5: Q27

	(1)	(2)	(3)	(4)	(5)	(6)
MVNO	0.758				0.963	
	(0.547)				(0.596)	
log Total Assets	0.159			-0.066	0.440**	
	(0.101)			(0.268)	(0.210)	
log Subscriber		-0.034		0.030		0.893*
		(0.147)		(0.319)		(0.475)
in-outbound ratio		-0.696		-0.685		-0.535
		(0.570)		(0.560)		(0.447)
agg lobbying			0.449		-2.168	-4.728
			(1.246)		(2.232)	(3.397)
ln length			-0.918		-1.348**	-3.100**
			(0.595)		(0.656)	(1.569)
Constant	-3.378**	0.502	6.503	0.519	3.188	10.653
	(1.653)	(2.646)	(4.596)	(2.643)	(5.099)	(8.793)
N	33	24	32	24	32	24
R-squared	0.080	0.048	0.071	0.049	0.232	0.330

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

5.5 Policy choices of the demand and supply sides

On the demand side of the political market, we identified that the preferences of operators depend on their market position. Characteristics such as being a net seller or buyer of roaming services, operating in one or many countries, and bargaining power in the negotiation of roaming agreements are among the factors that influence their preferred regulation. The regulatory environment of the wholesale roaming market is of strategic importance for firms and, therefore, they employ an integrated-strategy approach where their regulatory preferences align with their market strategies. The diverse incentives led to different positioning on policy preferences and, consequently, more intense competition on the demand side of the political market.

On the supply side, we could not pin down concretely the factors that would consistently explain the positions taken by the Commission, or that could explain alignments of positions. In this case at least, we can reject the hypothesis that lobbying efforts positively impact policy outcomes from the perspective of the private sector. There is no evidence that either large corporations' interests or lobbying efforts influenced the decision of the European Commission.

In order to understand the choices of the Commission, we propose looking beyond the lobbying efforts to the publication of the first legislative proposal. The Commission has been regulating roaming markets since 2007 when the *Roaming I* package entered into force. As part of the implemented regulation, the Commission was responsible for monitoring its impacts on the market. Thus, when the Commission started reviewing wholesale roaming regulation, it was aware that the market was not sufficiently competitive due to market failures and structural particularities such as the oligopolistic nature of national wholesale roaming markets, the bilateral nature of roaming agreements, imperfect wholesale roaming substitutes, and the exclusion of MVNOs from wholesale roaming markets (Commission, 2011, 2016a). The lack of competition gave large MNOs significant bargaining power over setting the wholesale price.

The European Commission clearly stated that one pillar of the strategy for the digital single market would be the creation of the right conditions for the development of the services including regulatory provisions for fair competition (Commission, 2015). Competition rules are the Commission's main tool for promoting the single market (Wilks, 2015). Thus, considering the Commission's institutional role, its strategy for the digital single market, and its analysis that roaming markets are not sufficiently competitive, it is reasonable to conclude that stakeholders would expect a legislative proposal that would incentivise competition. Indeed, the proposal for the wholesale roaming regulation included a single EU-wide price cap that was lower than the one in force at that time. This decision was favourable for small MNOs and MVNOs, which benefitted from improved conditions to compete with large operators.

Given the technicalities of the roaming market and the need to maximise its legitimacy, the Commission relied on different sources of information to design the new regulation. On one hand,

assessment of the costs of providing roaming services hinted at the level of the sustainable cap. On the other hand, the public consultation revealed additional aspects of the functioning of the market that could not be identified through cost simulations, for example, the lack of bargaining power of small MNOs and MVNOs in roaming service agreements. The consultation was essential to confirm the suspicions of the Commission about the non-competitive aspects of the market. It revealed that while some large operators and net receiver operators argued that the wholesale roaming market worked fine and caps should not be lowered, many operators, usually small MNOs and MVNOs, faced challenges negotiating roaming agreements.

The Commission's choices coincided with the options that received the most support from the stakeholders, as showed in Figure 6. It is noteworthy that, for each question, the group of stakeholders aligned with the Commission changes, suggesting an intense fragmentation of the demand side that weakened individual lobbying efforts. This fragmentation meant that the Commission faced less resistance to advancement of its agenda, as in all cases it had some support from some stakeholders, regardless of these latter's policy preferences.

The literature in EU lobbying suggests that the Commission tends to follow the opinion of the majority or to yield to the pressure of stakeholders, a sort of democratic decision-making process—the ad hoc coalition explanation. Klüver (2011), following Baumgartner et al. (2009), defines lobbying coalitions as a group of stakeholders lobbying for the same policy objective without an explicit agreement. Our interpretation of her result is that the positive effect of coalitions is stronger when the policy issue is more salient.[13] Although the decision of the Commission corresponds to the preference of the majority in the case of the wholesale roaming regulation, the analysis presented above suggests that the Commission was not merely following the majority: Its own policy agenda was the main driver of the decision.

In any case, finding a close correspondence between the Commission's final decision and the general opinion of a public consultation should not be surprising. The Commission can always choose whether to address an issue. A public consultation may contain dozens of questions, but the ensuing proposal for a directive may only respond to a few of them. The Commission might be reluctant to push for a policy change that would encounter too much resistance from the private sector, since it could undermine its legitimacy as the main driver of European integration. The explanation by Klüver (2011) may thus require a new interpretation. Salience being a source of legitimacy, following the larger ad hoc coalition could be an appealing option for the supplier of policy. The Commission could rely on public consultations and discussions with the stakeholders to identify the domains in which preferences are sufficiently divided to allow the Commission to

[13] Klüver (2011) claimed that the effect of salience, defined as the attention drawn by a policy issue, on lobbying success is positive if the stakeholder belongs to a larger coalition. However, we find our interpretation easier to fit into causality inference. Lobbying success is driven by the size of the coalition but not salience of an issue, which is issue-specific and thus the same for all stakeholders.

navigate the fragmented opinion, pushing policy initiatives in line with its long-term objectives. This would be consistent with the observation that the Commission's decisions are closer to that of an ad hoc coalition when the issue is more salient.

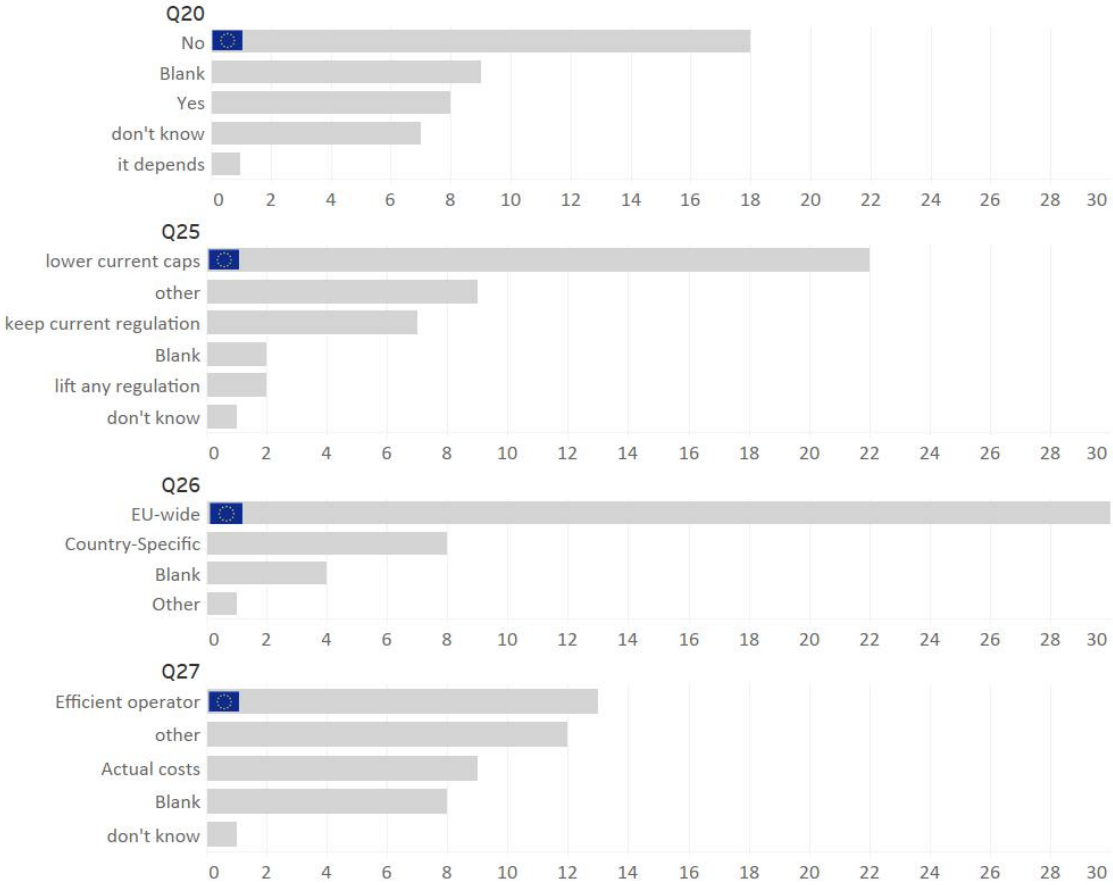

Figure 6: Policy preferences

6 Discussion of the Political Market

The making of EU wholesale roaming regulation can be characterised as a political market where the demand side is composed mainly of business representatives who seek different outcomes. In this policy race, they interact with the European Commission, the supplier, who is in charge of the design of the legislative proposal that relies on external expertise and information to design the legislation. This regulation is strategic for both sides. For the Commission, it represents an important step toward the development of the digital single market, which is one of its priorities. For the firms, it represents a major change in their operations with a direct impact on revenues.

From the textual analysis we conducted, we identified two clusters on the demand side, reflecting their focuses as revealed by the information submitted to the Commission. The two clusters roughly correspond to the division into types of operations (MNOs vs. MVNO) and, thus, the result seems

to suggest that the main debate was between the two camps. However, a closer look into the preferences revealed by their chosen options tells us that preferences were diverse even within each camp. There is almost no evidence that operators joined forces to present a single and louder voice.

Although such a fragmentation on the demand side of a political market in the same sector and nature is uncommon, it is not totally unexpected in this particular case. The approval of the RLAH at the retail level represented a drop in revenues for some operators, and firms were aware that the Commission was pursuing a digital single market where competition would be incentivised. Facing a potential regulatory change, firms needed to develop strategies to adapt to the change in a way that would limit the damages or maximise the benefits. Careful analysis of the replies to the consultation shows that stakeholders had different motivations, which were based on their individual features. Although there is evidence of broad trends in the lines of logic, we do not find stakeholders with certain characteristics consistently aligned on all questions. For instance, companies with a lower inbound-outbound ratio tend to support lower price caps, but they disagree with each other on the implementation level (national or EU-wide) and on the choice of reference (hypothetical or actual operator).

This fragmentation of the demand side impacted the effectiveness of firms' lobbying strategies. Our results suggest that factors such as market power or individual lobbying efforts did not drive the Commission's choices. On the contrary, the Commission followed its policy objectives and proposed a regulation that fostered competition. Indeed, the public consultation was a tool to legitimise its choices. Despite the divergence of preferences among the stakeholders, only on one single issue did the Commission's choice align with the preference of most of the stakeholders. However, large corporations that invested more in lobbying, measured by a composite measure of lobbying efforts and the amount of information provided in the response to the consultation, were, on average, the stakeholders whose views were further from the ones of the Commission. Obviously their arguments did not convince the Commission, but allowed the Commission to identify their intention to protect their strong market power.

It is also interesting to analyse the behaviour of business associations in the making of this regulation. We expected that they would unify the discourse of some stakeholders. As highlighted by Rajwani et al. (2015), these associations aim to influence the policy-making process on behalf of the collective needs and objectives of their members. However, we noted that business associations were not capable of unifying the preferences of their members. In fact, the associations decided to remain neutral on most of the questions. We observed that this usually occurred when their members were not aligned. For example, ETNO and GSMA took neutral positions on all the questions. Among GSMA members, there are operators with contrasting positions such as the MVNO Transatel, the large MNO Orange, and the single-country MNO PT Portugal. ETNO has only MNO members, but they have different profiles. Some are single-country operators while others are the largest operators in the EU. Also, while some of them are net receivers, others

are net senders. Conversely, when members were aligned the associations disclosed their position. This was the case with MVNO EU, all of whose members were convergent on all questions. ECTA decided to take a position on only half the questions, coinciding with those on which their members were of the same opinion. This finding also reinforces the existence of the intense competition on the demand side.

The design of wholesale roaming regulation clearly fostered a more competitive market environment. The Commission's choices are in line with its mandate of promoting a level playing field in the EU internal market by curtailing the power of the dominant players. As an institution, the Commission seeks more legitimacy, and it needs to build and keep its reputation as an impartial entity—this is mainly achieved through its regulatory outputs. This finding counters the perception that the European Commission mainly serves the interests of large multinational corporations as described by ALTER-EU (2018), which reported a pervasive influence of businesses in banking regulation and international trade agreement design. At least in the case of the wholesale roaming regulation, the European Commission demonstrated sufficient independence. This result does not imply that business lobbying is completely ineffective—we observe intensive lobbying going on every day in Brussels. However, in a political market in which the demand side is fragmented into competing camps, the effectiveness of lobbying is substantially undermined and the supplier finds less resistance in the political market. That being said, from a social welfare viewpoint, the public decision is better/more informed.

The literature has not clearly assessed the implications of a competitive demand side and a resolute and election-independent supply side for policy outcomes. It has mainly focused on cases where elected politicians are in charge of the supply side. Defining lobbying as efforts to change the status quo, Baumgartner et al. (2009) found that financial advantages had a slight positive effect on both protecting and challenging the status quo, and no evidence that organised interest groups in opposition diminished the chance of policy success. This result seems to suggest that competition on the demand side is not a significant obstacle to lobbying success. However, their empirical model is unable to explain most of the variations in policy success, suggesting that either policy success is a very random event or they have not taken into account some influential factors.[14] Differences between the EU and the US cast doubt on whether most of the research on the US would carry over to the EU, where officials are not directly elected by citizens. Moving away from elected politicians, McKay and Yackee (2007) studied agency rule-making in the US and found evidence that agencies tend to maintain their rules (keep the status-quo) when there is intense interest group competition, and are more likely to change the rules when one side dominates the lobbying efforts. The results suggested that agencies listen to loud and united voices. Our work, also studying an agency, provides evidence that an agency is more able to pursue its own aim when stakeholders on the demand side of a political market are sufficiently diverse in preferences. It also argues in favour of maintaining the (political) independence of decision-makers. When a

[14]The R-squared ranges from 0.04 to 0.29 for the most important results.

political or decision-making entity does not rely on stakeholders to get appointed or elected, it can easily benefit from potential division among the stakeholders to fulfil its mandate, in particular by ignoring the "weight" of the more powerful actors.

6.1 The aftermath

Publication of the draft legislation is one of the first steps in the policy-making process, which includes discussions with other EU institutions, the Parliament, and the Council, to reach agreement on the legislation to be enacted. It is noteworthy that the main structure of the Commission's proposal was approved. However, the biggest area of disagreement was the value of the cap on roaming services; in particular, the cap for data services. While the Commission proposed a cap of €8.5/Gb, the Parliament proposed an initial cap of €4.0/Gb and the Council proposed an initial cap of €10/Gb.[15,16] In the view of the Parliament, the Commission took a conservative approach that did not consider technological developments in the sector that would allow a decrease in the costs of providing roaming services. Concerning the Council's position, we find no report where arguments were presented for the suggested cap. The three institutions reached a final agreement setting the initial price cap for data services at €7.7/Gb.

Despite limited access to information, we are aware that lobbying happens in other EU institutions but cannot measure its effects. What we know is that the rapporteur of wholesale roaming regulation in the European Parliament was a Finnish MEP, who might have been able to amend the agenda of the discussion in a way that countries sharing similar environments to her home country would be favoured. On the other hand, there was some speculation that some members of the Council were trying to protect the interests of their large national operators and, therefore, pressuring for a higher cap.[17,18]

Even with the decrease in the caps, MVNOs and some operators from net sender countries claimed that the cap was still too high to allow them to afford providing RLAH.[19,20] This raises the question of whether lobbying strategies were unsuccessful. A cap as high as possible was the

[15] Report on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 531/2012 as regards rules for wholesale roaming markets (COM(2016)0399 – C8-0219/2016 – 2016/0185(COD)) accessed on June 2019: http://www.europarl.europa.eu/doceo/document/A-8-2016-0372_EN.html.

[16] Council press release accessed on June 2019: https://www.consilium.europa.eu/en/press/press-releases/2016/12/02/wholesale-roaming/.

[17] Article from Politico entitled "EU reaches mobile roaming deal": https://www.politico.eu/article/eu-reaches-mobile-roaming-deal/.

[18] Tallberg (2008) found, from interviews conducted with top officials, that despite some influences from key institutions and individuals, the largest source of bargaining power inside the European Council came from the situation that Germany, France and the UK could usually set the parameters of negotiations.

[19] Telecompaper article accessed on June 2019: https://www.telecompaper.com/news/mvnos-unhappy-with-high-eu-wholesale-data-roaming-rates-1181912.

[20] Article published on Esmerk Baltic News on February 1, 2017 entitled "Estonia: Telecoms operators claim cap on roaming charge too high".

objective of many large operators. Even if at the first sight they were not successful in avoiding a cap reduction, their lobbying efforts might have been succesfull in avoiding a more significant reduction. A more detailed research that covers inter-institutional lobbying in the EU would be interesting to yield a better understanding of the lobbying dynamics and outcomes. Still, the challenge is the lack of transparency and thus data from some parts of the decision-making process.

7 Conclusion

This work studies changes to the regulation of the European Union wholesale roaming market through the lens of the framework of political market for policy. Employing topic modelling, we identify two clusters of stakeholders according their textual inputs to the public consultation launched by the European Commission. However, we do not find that the stakeholders within a cluster were aligned in their preferences on the four selected issues/questions. This fragmentation provides room for independent decisions by the Commission. Regression results show no evidence that the Commission consistently made its decisions according to a fixed set of characteristics, implying that there was no favouritism towards certain stakeholders. Instead, we reason in conclusion that the Commission had predetermined positions over different issues and the public consultation in fact gave legitimacy to the Commission to implement the regulatory changes.

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Appendix

A. Topic Modelling

A.1 Data Preprocessing

Processing large collections of documents is a complex and challenging task for text mining algorithms. The first step is text preprocessing, which essentially involves converting the text into data for further analysis. The output from this stage has a big impact on the analysis stage, as shown by the authors in (Uysal and Gunal, 2014) for the specific field of text classification. Natural language processing and statistical and analytical techniques are the main tools for this step. The tasks of preprocessing are mainly tokenisation, filtering, stemming and lemmatisation, which prepare the input for generation of a vector space representation.

Cleaning, Filtering and Tokenisation Cleaning consists of removing all special characters from the original text, such as delimiters from html or urls, etc. Blank spaces and line breaks are also removed. In order to avoid any problems related to the encoding of characters, we decoded the text to 'utf8' as the most standard text encoding format and fixed Unicode problems.

For filtering, we used a pre-compiled stop-words list for English. We also defined a new list of domain-specific terms that could be removed (e.g. answer, question, response, explain). This is a good practice to avoid those terms that are common but not very important for defining the semantics of a given domain. The stream of text is then broken into pieces to generate a list of tokens. We generated bi-grams (sequences of two words that appear with a frequency exceeding a fixed threshold) to better capture the semantics of text classes.

Stemming Stemming reduces inflectional forms of a word to a common base form (Manning et al., 2008). It is used to reduce words to their root by deleting prefixes and suffixes. In this study, we used the Porter's stemming algorithm (Porter, 1980). For example, if two stakeholders, A and B, wrote "regulation" and "regulatory" respectively, stemming prepares the input texts by grouping the two words together—therefore "regul" as an output appears two times. When talking about regulation in general, stemming is useful for identifying the concept for later analysis (clustering stakeholders or predicting position).

Word counts and tf-idf After preprocessing, the text is turned into data by computing the tf-idf (term frequency - inverse document frequency) weight for each term. Tf-idf is a statistical measure that evaluates how important a term is to a document in a collection, computed as: $tf\text{-}idf_{t,d} = tf_{t,d} \times idf_t$ where $idf_t = log(\frac{n_{documents}}{df_t})$ and df_t = number of documents containing t.

A.2 Topic modelling

Having a large volume of unstructured textual data collected from the answers of stakeholders, our objective in the first stage is to discover hidden topics that occur in this collection. Topic

modelling, an unsupervised statistical machine learning technique, provides us with appropriate methods to achieve this goal. It allows to have insight into what a corpus is talking about by transforming the word space of documents into a "topic" space, much smaller and more easily interpretable by humans. We focus here on Latent Dirichlet Allocation (LDA) proposed by Blei et al. (2002) as it is the most popular model used in the social sciences (Sukhija et al., 2016).

Process First a document is presented as a bag of words (BOW) that is described as a word-document matrix in which values w_{ij} represent the frequency of word i in document j. Then the model is trained using the vocabulary matrix as input. The LDA model assumes that a document is a mixture of topics and that a topic is a coherent cluster of correlated words. It outputs two matrices, one presents the document probability distribution over the topics (per-document topic distribution), the other presents the topic probability distribution over words (per-topic word distribution). The algorithm does not attach labels to describe topics, a good topic should be individually interpretable.

Algorithm parameters To generate a more understandable result, we delete some very frequent and infrequent terms. Those tokens appearing in more than 90% of the documents and those appearing fewer than five times are deleted.

In order to get accurate topic estimates that guarantee good topic interpretability, training parameters must be set carefully. In our case, we considered 20 passes through the entire corpus after each of which the model was updated and used small chunks (sub-corpora) for updates to accelerate convergence of the model estimation. The model is trained until the topics converge or the maximum number of iterations (fixed at 400) is reached.

We do not appeal to topic coherence to judge the optimal number of topics because those charts sometimes yield inconsistent conclusions. However, we find that fixing the number of topics to two always gives interpretable clusters of terms and stakeholders and is also consistent with topic coherence most of the time.

Visualization of the Result We use a web-based interactive topic model visualization to help us interpret the topics in the fitted model (Sievert and Shirley, 2014). Figure 7 shows the distribution of topics over the vocabulary of the roaming corpus with $K = 2$. The left part of the figure displays topics as circles (two topics are generated), the right part shows the top 30 most relevant terms for topic one. The blue and red bars give the overall term frequency and the estimated term frequency within the selected topic respectively.

B. The Four Selected Questions

We briefly discuss the four questions.

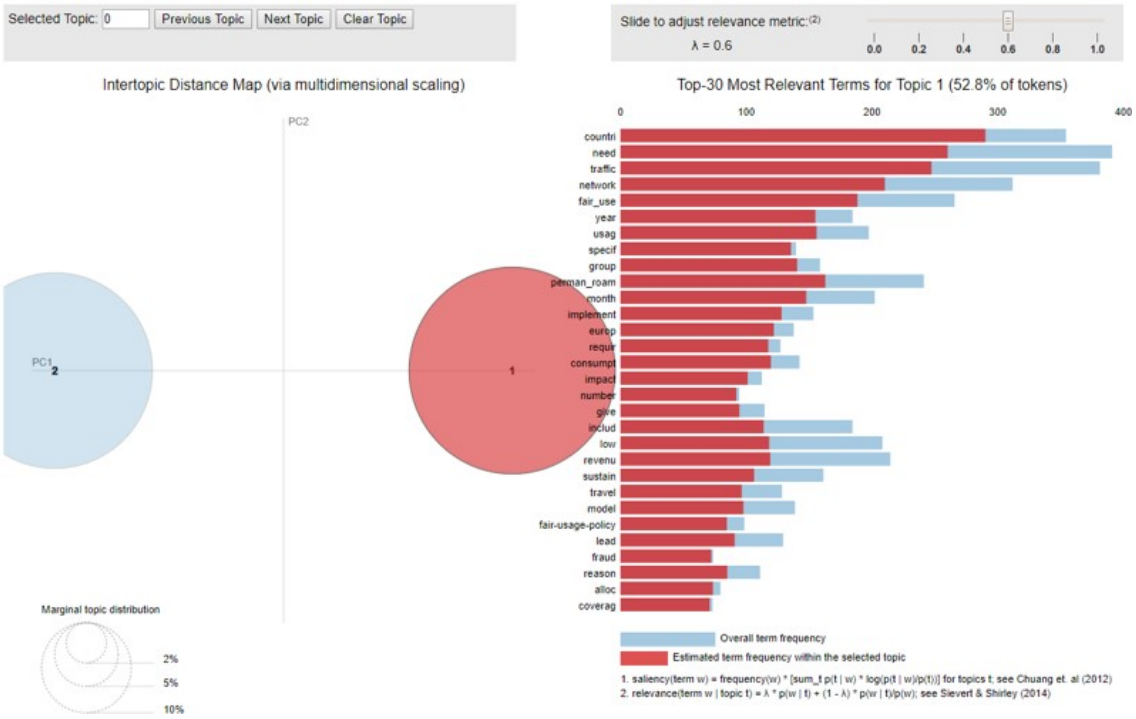

Figure 7: Topic-term distribution of Topic 1 generated with $K = 2$.

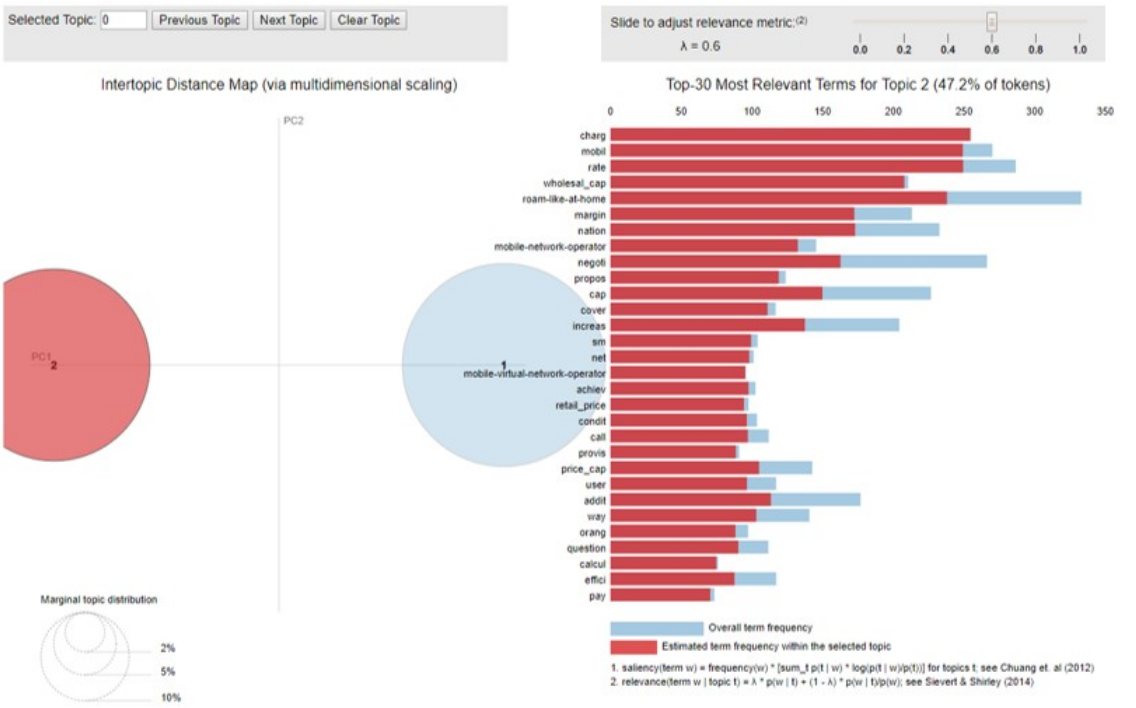

Figure 8: Topic-term distribution of Topic 2 generated with $K = 2$.

> Question 20: Do you consider that the functioning of the national wholesale roaming markets absent [of] regulation would be capable of delivering RLAH at the retail level in accordance with the domestic charging model?
>
> Options:
>
> - Yes
> - No
> - It depends on the Member State
> - Don't know

Question 20 is arguably the leading question as it explicitly asked the stakeholders whether they think RLAH could be achieved without any regulation, currently a price cap on the wholesale price. Providers who sell services at the cap, or close to the cap, would support the idea of removing any regulations since they would be able to charge a higher price. Still, they were asked to explain and justify their position. Meanwhile, those paying a high price were very likely to say "no".

> Question 25: What would be the most appropriate of the following options at the wholesale level to enable the provision of retail roaming services at domestic prices in the EU, subject to any fair use policy to prevent anomalous or abusive use?
>
> Options:
>
> - Lift any wholesale roaming regulation
> - Keep current roaming regulation (Regulation No 531/2012) unchanged, i.e. maintain current wholesale roaming price caps
> - Lower current wholesale roaming price caps
> - Other (please specify below)
> - Don't know

Question 25 touches the core of the public consultation. Stakeholders are asked to choose an option that would facilitate the implementation of RLAH. *Ex post*, we know that the Commission proposed reducing the cap.

> Question 26: If you consider that new wholesale roaming price caps should be defined, should these caps be:
>
> Options:
>
> - EU-wide: the level of the wholesale roaming price cap is the same in all Member States
> - Country-specific: the level of the wholesale roaming price cap is different in each Member State, reflecting the differences in the costs of providing mobile communications services in each Member State

- Other (please specify below)
- Don't know

Question 26 concerns the scale on which the regulation is imposed. As costs of providing wholesale roaming services vary across Member States, it would be natural to think that price caps should be set differently. However, heterogeneous caps may delay the European integration process and determination of the caps is complex and perhaps arbitrary.

> Question 27: In case of EU-wide new wholesale roaming price caps, should these caps be set:
>
> Options:
>
> - By reference to the costs of providing wholesale roaming services across the EU by a hypothetical efficient operator (i.e. an operator using the most efficient technologies and optimal operations commercially available)
> - By reference to the actual costs of providing wholesale roaming services across the EU by existing operators
> - Other (please specify below)
> - Don't know

Question 27 concerns the method of cost estimation and determination of the caps. Making reference to a hypothetical efficient operator means the estimated cost will be the lower bound. Less efficient service producers may then not be able to recover the costs if the cap is too low. In the *Commission Staff Working Document* published on June 15, 2016, the Commission disagrees with the idea of referring to actual costs because making reference to actual costs implies compensating inefficient operators (Commission, 2016a).

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