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## COMPETITIVE ACTION REPERTOIRE IN THE TELECOMMUNICATIONS INDUSTRY

*Our paper describes how competitive action repertoire concept and the external regulatory environment influence the performance of a firm in the regulated telecommunications sector. Based on panel data of 103 firms across Europe that provide fixed broadband Internet to end customers during the time period of 3 years, results indicate that aggressiveness and the complexity of an offer have a positive relationship with market share growth. Contrary to widespread views, we find that the most aggressive firms in the market in fact lose market share on a year-on-year basis. Our results suggest that complexity and aggressiveness have a positive relationship with changes in market share gains and that the effects hold for non-regulated firms, but not for regulated ones.*

*Keywords: competitive dynamics, competitive repertoire, regulation, telecommunications industry, fixed broadband*

### 1. Introduction

Today's hypercompetitive environment is constantly modified and challenged by current strategies. Competitive dynamics research studies competitive moves

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and countermoves among rivals on the market, their strategic orientation and organizational context (Baum & Korn, 1996). It helps us explain the success and failure of a firm and offers a useful integrative framework within the modern strategic management theory that connects the micro and the macro level of strategic thinking, strategic formation and implementation (Miler & Chen, 2012).

Until some 30 years ago, network utilities were state monopolies. Due to poor performance and innovation lagging behind, countries began with a liberalization process which involved privatization, competitive restructuring and set up of new regulatory mechanisms (Armstrong *et al.*, 1994). Competition is now strongly influenced by the regulatory regime that is based on open access to incumbent networks, where wholesale access to fixed networks and regulatory obligations at retail level have a positive influence on the shape of industry dynamics. Regulatory obligations have been imposed on the incumbents' intensified competitive dynamics among players on the market. Challengers buy the incumbents' wholesale services and compete with them in the same market. Being more flexible than their main opponent, they are able to offer services on the incumbent's network at the same quality level but at lower prices.

This study challenges the benefits of aggressive and complex strategy of competitive repertoire on market share growth in the telecommunications industry. The question is why are big telecommunications firms experiencing market share downturns? Is such result a consequence of their competitive intensity? Or is it a consequence of the complexity of their competitive repertoire? How does government intervention, through regulation, affect changes in market share gains?

In competitive dynamics studies, research used to include internal and external factors which helped to explain competitive intensity and the impact of competitive behavior on the performance of a firm. The intention of this empirical study is to analyze competitive intensity under the burden of regulation and to find effects of competitive aggressiveness on market share growth in the regulated telecommunications industry.

This study contributes to competitive dynamics research in two ways. First, we contribute to the analysis of the competitive action repertoire and its impact on the change in market share gains in a regulated telecommunications sector. Second, we study the effect of regulatory obligations on strategic directions of regulated and non-regulated firms by analyzing the relationship between the competitive action repertoire and the year-on-year market share gains they achieve. Competitive repertoire study in the telecommunications sector is Lee's (2017) incentive to conduct a more detailed study of competitive behavior in the global industry settings, where moves and countermoves of competing firms should be more carefully analyzed due to the influence of specific external factors, such as changes in the government regulatory policy. This empirical investigation is an

extension of the current competitive dynamics research that connects macro-competitive (regulation) and micro-actor viewpoints (competitive intensity and competitive complexity).

The following sections contain a presentation of the theoretical bases: competitive repertoire and regulatory influence on competitive behavior. They are followed by a developed hypothesis that builds on the current research in competitive dynamics research by applying external regulatory factors that determine competitive behavior and trigger changes in market share gains. The methodology section provides details of the data collection process, statistical methods and the results of the empirical study. The discussion section compares empirical results with other theoretical and empirical findings, as well as implications for managerial practices. The paper ends with a conclusion and limitations and directions for future research in the competitive dynamics theory.

## 2. Theoretical background and hypothesis

The central part of the competitive dynamics research is an action. It is defined as internally and externally newly detected market-based competitive move used by an organization during a given time period in order to defend your competitive position (Jacobson, 1992; Grimm & Smith, 1997; Smith, Grimm & Gannon, 1992, Chen & Hambrick 1995; Ferrier, Smith & Grimm, 1999, Miller & Chen, 1996). The term ‘an action’ comes from the Austrian school and it represents Schumpeter’s (1950) effort to explain the way firms affect each other while aiming to achieve competitive advantage. The Austrian school sees competition as a dynamic process by which firms are destroying market equilibrium and establishing it again. The main focus is change - competitive move by one firm may cause a series of moves and countermoves by competitors in the market (D’Aveni, 1994; Lee, 2017).

Competitive action repertoire is defined as a set of actions that firms undertake in a specific time period (usually one year) (Miller & Chen, 1994, 1996, Ferrier & Smith, 1999). Extensively studied parts of the competitive repertoire are firms’ aggressiveness and competitive complexity (Ferrier, 2001; Connelly *et al.*, 2016, Andrevski & Ferrier, 2016). Competitive aggressiveness stands for firms’ intensity on the market and represents multiple initiated moves and responses carried out over time (Ferrier, 2001), while competitive complexity captures set of different types of actions firms undertake (Ferrier, 2001; Miller and Chen, 1996).

**Competitive aggressiveness** is the main construct in the competitive dynamics research and it is the answer to differences in firm performance (Chen

*et al.*, 2010; Young *et al.*, 1996). It shows *in what way* are certain firms doing better than their competitors. Empirical research of competitive dynamics finds that aggressiveness has a positive impact on changes in firm performance (Ferrier, 2001; Katila *et al.*, 2012; Chen *et al.*, 2010; Derfus *et al.*, 2008; Young *et al.*, 1996; Andrevski *et al.*, 2014). Nadkarni *et al.* (2015) presented three main benefits of being aggressive: a) it brings value added to customers by offering better products or services at lower prices, b) it positively impacts performance measures because other firms on the market cannot easily follow aggressive firms, and c) being aggressive over time enables firms to jump into the constant process of learning by doing (by real-time information from the market).

Beside the general conclusion that competitive aggressiveness positively impacts performance, there are empirical studies that show different effects of competitive aggressiveness on firm performance. Positive impact is especially evident in a hypercompetitive environment where competitive advantage is temporarily achieved (D'Aveni, 1994), like in the fast growing industries (Nadkarni *et al.*, 2015), in the growing markets (Andrevski & Ferrier, 2016), or in newly developed markets (Chen & Miller, 2012). In those markets, firms with continuous and aggressive competitive strategy are more successful (Katila & Chen, 2008). On the other hand, we can find empirical studies that failed to find a statistically significant relationship (Chen *et al.*, 1995; Hambrick *et al.*, 1996) or that proved opposed results. For example, Chen *et al.* (2010) have found a negative relationship by analyzing competitive behavior in established and newly developed markets. They showed that firms with high performance are not motivated to use aggressive strategy. Their objective is to maintain the *status quo* and to be adequately prepared to respond to competitor attack. But smaller firms are using the strategy of being aggressive in order to take over a part of the market (Chen *et al.*, 2010). Katila *et al.* (2012) found that all firms (despite their resource background) can benefit from competitive aggressiveness. It depends on the market on which they compete – new or already established. In newly developed markets firm aggressiveness positively impacts performance. Andrevski & Ferrier (2016) have conducted an empirical study of firms in three different industry sectors characterized by hypercompetitive environment and concluded that aggressive competitive strategy impacts performance in a ‘U’ curve shape. Very aggressive strategy is accompanied by higher costs that negatively impact firm performance. Firms differ in the resources and capabilities they possess, causing them to develop different actions. However, having more resources is not always a guarantee to compete more aggressively on the market and to be more successful. Ndofor *et al.* (2011), Miller & Shamsie (1996) and Derfus *et al.* (2008) have shown that resources are important for competitive aggressiveness and firm performance. On the other hand, Andrevski & Ferrier (2016) found that even firms with specialized technological resources and dense alliance networks can benefit from competitive aggressiveness.

According to the above mentioned results of empirical studies, we can conclude that aggressive competitive strategy is not suitable for all and firms should be more concentrated on effective and balanced actions in order to outperform rivals and achieve performance goals (Lieberman & Montgomery, 1998). In the regulated telecommunications sector incumbents possess rich resource portfolios, knowledge and experience on the market. They are the most aggressive on the market and in many analyzed countries have the highest market share. On the other hand, challengers have the opportunity to use the incumbent's resources at wholesale level and by applying the strategy of being more aggressive they can positively impact performance. The first hypothesis intends to empirically test the relationship between competitive intensity and firm performance in one regulated telecommunications industry:

*H1 There is a positive relationship between competitive aggressiveness and market share gains.*

**Competitive complexity** is a representation of a firm's intensity on the market and a mixture of multiple initiated moves and countermoves over time (Ferrier, 2001). Competitive complexity is a function of a firm's internal factors. Internal factors are embodied in a firm's resources and capabilities. They can produce positive changes in the market share by price changes (short-term effects), or by enhancing the perceived value of their services. Whereas, external factors can drive market share changes via a competitor's entrance or exit, customers' willingness to buy more, market characteristics, regulatory environment, etc. An action can be the introduction of new products and services, service improvements, setting lower prices (for example due to economies of scale) or upper prices (due to quality improvements), actions of extensive advertising, etc. Firms are usually using a mix of the above-mentioned types of actions. What kind of competitive repertoire to use, depends on the environment in which firms do their business. In a stable environment firms are using repetitive simplicity, while in unstable environments they tend to use a more complex set of actions (Miller & Chen, 1996).

The strategy of competitive complexity repertoire seems challenging, however, firms benefit from it. Empirical investigations contribute to valuable insights about outcomes and antecedents of the competitive complexity concept. Studies have found their positive relationship with firm performance (Ferrier & Lee, 2002, Miller & Chen 1996). Competitive complexity is also a function of prior performance of a firm (Miller & Chen, 1996), multimarket contacts (Yu *et al.*, 2009) and top management team heterogeneity (Miller & Chen, 1996). Complexity represents the firm's ability to launch different sets of actions. Yet, is the competitive complexity concept a necessity to achieve required performance? Complex competitive repertoire is a signal of a firm's quality and efficiency in adequately pursuing resources and firm capabilities, it ensures positive signals from stake-

holders (Miller & Chen, 1996) and results in improved firm performance (Ndofor *et al.*, 2011; Carnes *et al.*, 2019). Connelly *et al.* (2016) find that complexity harms performance at the early stage, but that later it has positive effects.

Our second hypothesis aims to empirically test the relationship between a firm's complexity and market share gains in the telecommunications sector. It is known that incumbents are capable of generating different types of competitive moves because of their resources, knowledge and experience. Challengers used to use a lower number of resources (the first challenger can be an exception) and concentrate on a certain type of competitive moves.

The hypothesis is as follows:

*H2 There is a positive relationship between offer complexity and market share gains.*

### **Regulation has an influence on the relationship between the competitive action repertoire and firm performance.**

Sources of competitive repertoire can be found inside, as well as outside the organization. Applying different antecedents can be beneficial for an improved contextualization of competitive moves and their consequences on firm performance. Big and small firms use different competitive strategies, and they behave differently in already established and new markets. Characteristics used outside the organization are environmental change (Nadkarni *et al.*, 2015), institutional investors (Connelly *et al.*, 2016; Morgan & Ferrier, 2014; Morgan *et al.*, 2018), new or established markets (Chen *et al.*, 2012), market growth (Miller & Chen, 1996) and industry concentration (Ferrier, 2001).

In this empirical study there is an intention to use a new antecedent that shapes competitive behavior and firm performance - regulation. Regulation is an external factor that impacts competitive strategy and performance in the telecommunications industry. The telecommunications sector is highly regulated, where regulatory agencies regulate mainly those firms with a significant market share, rich technological resources, knowledge and capability to exploit it. Accordingly, regulated firms are relatively more aggressive in the actions they launch on the market. However, since they are regulated, they are limited in exploitation of their resources and capabilities. This is especially evident in the prices of offers they deliver, compared to those of competitors. As a consequence, many incumbents are faced with a downturn in market share gains on a yearly basis. The regulation process opened up the market and attracted new investors and concentration indexes started to decrease (Pejić Bach *et al.*, 2013).

In competitive dynamics research there are differences in performance between small firms with limited access to resources and those with a rich resource

base (Katila, *et al.*, 2012). Firms with rich internal and external resources compete more aggressively on the market (Ndofor *et al.*, 2011), and deliver superior profits. Andrevski & Ferrier (2016) pointed out that the strategy of being more aggressive on the market is not the key to deliver superior performance for a longer period and firms with specialized technological resources can also be a source of superior performance. But we still lack knowledge of why some of the more aggressive firms with a rich resource portfolio still incur losses in market share gains, while others do not. The third hypothesis aims to empirically test the relationship between the competitive action repertoire and market share gains, for regulated and non-regulated firms.

*H4 Regulated and non-regulated firms differ in the relationship between the competitive action repertoire and market share gains.*

### 3. Measures

#### *Dependent variable*

**Firm performance** represents the long-term tendency and strength of a firm. In strategic management studies, it can be measured via financial and non-financial indicators. Firms include market share as a non-financial indicator that stands for the key indicators of the growth (Makador, 1999; O'Regan, 2002; Ferrier *et al.*, 1999; Rindova *et al.*, 2010, Andrevski *et al.*, 2014). Higher market share enhances higher financial performance and greater customer retention (O'Regan, 2002). Empirical research on competitive dynamics shows different and opposing results in the market share-profitability relationship. Gale & Buzzell (1993) and Porter (1979) contend that market share has a positive impact on firm profitability. On the other hand, researchers (Armstrong & Green, 2007; Mische, 2001; Kay, 1993; Woo & Cooper, 1983) suggest that market share is not the main indicator of firm performance, and a small market share can also be the source of firm profitability. Despite the above-mentioned opposing results, we can be sure that market share is relevant and that a declining market share alerts firms to quickly react in order for the firm to regain its position or develop it in new markets (Yang & Meyer, 2015). It describes the position of a firm within an industry and can be explained as a function of the firm's internal and external factors. In the telecommunications sector, market share is usually one of the firm's primary objectives. It is commonly used in the fixed part of the network, where incumbents hold a significant part of the market and other operators are fighting for each of the incumbent's customers.

Market share can also be seen as an indicator of regulatory agencies' effectiveness, in the sense that it can explain the success/failure of their regulatory strategies.

Empirical research relies on previously validated measurement items (Ferrier *et al.*, 1999; Andrevski & Ferrieri, 2016) in order to capture performance and action-based variables. It applies year-on-year change in the customer's market share.

Firms' market share is calculated as:

$$\text{Log Market Share}_{i,t} = \frac{\text{Number of customers}_{i,t}}{\text{Total number of customers}_{L,t}}$$

Where  $i$  represents the firm,  $t$  represents time and  $L$  represents subscriptions on the country level.

Change in the market share is calculated as follows:

$$\Delta \text{Market Share}_{i,t} = \text{Log Market share}_{i,t} - \text{Log Market share}_{i,t-1}$$

Positive values indicate a positive change in year-on-year market change, while negative values indicate a negative change in market share gains.

### *Independent variables*

**Action aggressiveness** is measured by the number of competitive moves initiated by firms, relative to the sum of all competitive moves on the market. According to the previous research (Andrevski & Ferrier, 2016), we focused on externally detected product-market actions.

$$\text{Firm Aggressiveness}_{i,t} = \text{Log}\left(\frac{\text{Actions}_{i,t}}{\text{Actions}_{kL,t}}\right)$$

$\text{Actions}_{i,t}$  represents the number of competitive moves initiated by a firm and  $\text{Actions}_{kL,t}$  represents the number of actions initiated by all firms in the country  $k$  and during a certain time period.

**Offer complexity** represents the *within-firm* action type diversity (Ferrier *et al.*, 1999).

The following formula is based on Herfindahl's index of concentration:

$$\text{Offer Complexity}_{i,t} = 1 - \sum_i \left(\frac{\text{Action}_{a,t}}{\text{Total Actions}_{i,t}}\right)^2$$



Where  $\frac{Action_{a,t}}{Total\ Actions_{i,t}}$  represents the proportion of  $i^{th}$  firm's actions in total actions initiated by a firm in a certain period of time. A high value of offer complexity indicates a broad set of action types that a firm undertakes.

### ***Moderating and Control variables***

All models include a set of dummy variables on a *yearly basis* in order to control time-specific factors. We used control variables *technological solutions* and *Year* effect. Technological capabilities enable firms to create a more complex set of action types that differentiate them from rivals (Ndofor *et al.*, 2011). By using different technological capabilities, firms cover different geographical areas in the country. This enables them to create speedy actions that have positive influence on product/market firm activity (Yang & Meyer, 2015). We counted a number of technological solutions firms applied in a certain time period.

Telecommunications is one of the sectors where regulatory reform has had successful results, especially in the retail segment (Winston, 1993). Hence, we applied the control/moderating variable as a dummy variable for *regulation* (1 is when the firm is regulated, and 0 is otherwise).

## **4. Method**

The telecommunications sector provides an interesting empirical field to study competitive dynamics because of its historical background, where privatization and deregulation processes paved the way of a firm's aggressiveness among rivals. We studied companies that provide fixed broadband Internet access to end customers in European countries. The telecommunications sector is characterized by high capital intensity, with relatively high market concentration indices that show decline tendency (Pejić Bach *et al.*, 2013). Investigated firms are mainly listed on the stock markets and usually provide detailed information about their market shares, competitive moves and regulatory obligations. Hence, empirical research is based on *desk research* methods from secondary data sources.

### *4.1. Research instrument*

Followed by previous researches, the focus is on externally detected product-market actions (Ferrier *et al.*, 1999; Andrevksi & Ferrier, 2016). Opposed to the usual structural content data collection research instrument, this empirical study is based on the secondary data published on the websites of analyzed firms. In this way we avoided the commonly stated critique of the structural content data analysis (Smith, Ferrier & Ndofofor, 2001). Structural data content analysis has undoubtedly contributed to the competitive dynamics research in explaining the relationship between the competitive repertoire and firm performance. But it is criticized in the part of reasonable doubt in collection of all competitive moves. For example, less interesting competitive moves are not reported by media. Additionally, competitive moves by small firms on the market are often not covered. This research includes a higher number of firms, even those with a small market share. Moreover, the empirical study includes more than two firms on the market (opposed to the commonly used dyad level firm competitive analysis) and analyzes in more depth the competitive intensity among competing firms.

### *4.2. Data*

The empirical study covers European countries because of their historical similarity and regulatory background. The dataset comes mainly from the data published by the European Commission, Telecommunication Regulatory Agencies, and companies included into our sample. On an annual basis, the European Commission publishes pricing benchmarks for Fixed Broadband offers. The scope of that benchmark is to collect, analyze, and compare offers in order to consider what end consumers are paying for in EU28 as well as in other countries (e.g. Japan, Switzerland, USA, etc.)<sup>1</sup>. That includes retail offers launched by operators that all together hold at least 90% of market share in each country at the European level. For example, the 2013 benchmark covers more than 160 firms that operate in European countries. For some of them we did not get the data for each year we had studied, therefore, the firms with missing data for one or more years are excluded from the study in order to reach a balanced panel data set. The offers are collected during a certain time of the year (over our sampled period:

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<sup>1</sup> The Broadband Internet Access Cost (BIAC) reporting tool presents data from the annual BIAC study, which is performed by Van Dijk Management Consultants for DG Information Society and Media of the European Commission.

every February). Moreover, we consulted experts responsible for pricing strategies from some European firms in order to verify the reliability of collected data. We found that our data represents very well the relative aggressiveness of a firm. Relative aggressiveness on the market can be compared with the customer base at the end of the previous year (as many collected offers are valid from the previous year). For each of the above-mentioned countries, data concerning customer base growth are collected on a yearly basis. The European Commission annually publishes figures for incumbents and all other operators. As data for challengers was unavailable from this source, it is collected directly from the relevant companies' websites, as well as other sources that provide searched data (e.g. National Regulatory Agencies, Business Monitor Reports, etc.). The empirical study begins with year 2010 as the base year that is not included in the statistical model. Following Ferrier *et al.* (1999), the collected actions are grouped into the following sections: new product, service quality upgrades (advertised download speed), change in prices and contract duration actions. Each competitive offer is analyzed and classified into above mentioned action types. The same methodology is applied for all years.

### ***4.3. Statistical method***

In total, there are collected data for 103 firms operating in 28 European countries over the period 2010-2013. Hence, the sample provides a panel of business in the telecommunications sector, with a good representation of regulated and non-regulated firms operating on the market. A panel data analysis with fixed and random effects is applied. The Hausman test (Hausman, 1978) is used for testing the type of panel data model (fixed or random) and VIF test for analyzing multicollinearity effects. We used the established stepwise moderation approach (Aiken & West, 1991) to test for the interaction effects of imposed regulation on competitive aggressiveness and competitive complexity, as well as the Wald test in order to jointly test the significance for the total effects of independent variables on market share change. Hausman test suggest using the random effects model. Coefficients show that multicollinearity is not an issue as the VIF does not exceed the commonly used cutoff value of 5 (VIF=4,04 in case of interaction effect – Model 5).

## 5. Results

Table 1 shows descriptive statistics and the correlation matrix of variables examined in this study.

*Table 1.*

### SUMMARY STATISTICS OF THE MODEL

	N	Mean	S.D.	1	2	3	4	5	6
1 Log Change in Market Share	308	.02359	.1788						
2 Log Relative Agressiveness	307	-1.883	.64882	.013					
3 Regulated x Log Relative Agressiveness	307	-.70066	1.392.6	.016**	.018				
4 Offer Complexity	307	.38017	.2025	.136**	-.184	.090			
5 Regulated x Offer Complexity	307	.15709	.31280	-.034	.339**	-.336***	.160***		
6 Log Number of Technological Solutions	307	.50647	.42332	-.021	.382***	-.007	.055**	.102**	
7 Regulated	412	.4344	.73367	-.031**	.210***	-1.73***	-.012	.359***	.063*

where \*p<0.1, \*\* p<0.05, \*\*\* p<0.001

Source: by authors

Table 2 shows the results of the panel data regression analysis for all hypotheses.

Table 2.

RESULTS OF THE PANEL DATA REGRESSION ANALYSIS

VARIABLES	1 Log Change in Market Share	2 Log Change in Market Share	3 Log Change in Market Share	4 Log Change in Market Share	5 Log Change in Market Share
<i>Independent variables</i>					
Log Relative Agressiveness		0.036** [0.017]	0.033* [0.017]		0.056*** [0.021]
Offer Complexity		0.147*** [0.051]		0.141*** [0.051]	0.186*** [0.060]
Regulated x Log Relative Agressiveness					-0.059* [0.034]
Regulated x Offer Complexity					-0.163 [0.110]
<i>Control variables</i>					
Log Number of Technological Solutions	0.008 [0.026]	-0.009 [0.026]	0.001 [0.026]	-0.001 [0.026]	-0.010 [0.026]
Regulated	-0.063*** [0.024]	-0.074*** [0.025]	-0.078*** [0.025]	-0.057** [0.023]	-0.113 [0.072]
<i>Intercept</i>					
Constant	0.065*** [0.021]	0.089** [0.043]	0.134*** [0.041]	0.018 [0.027]	0.115** [0.054]
Observations	307	307	307	307	307
Number of Firms	103	103	103	103	103
Company RE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Standard errors in brackets  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: by authors

Model 1 in Table 2 takes into account only the control variables while all the unobserved heterogeneity is packed in the random effect component. The results suggest that regulation has a negative effect to year-on-year change in market share for regulated firms, while the number of technological solutions pushed by firms positively impacts change in market share gains, but the results are not statistically significant.

The first hypothesis studies the relationship between competitive aggressiveness and changes in market share on a year-on-year basis. Model 2 in Table 2 shows the results for the first hypothesis. The coefficient for the linear term of relative competitive aggressiveness is positive and statistically significant (B=0,03, p<0,1). The more aggressive you are relative to your opponents, the better results in the market share you achieve. The given results of the empirical study are consistent

with theoretical and other empirical findings in competitive dynamics research. Ferrier *et al.* (1999) revealed a positive relationship between competitive intensity and market share gains. Ndofor *et al.* (2011) also showed the same positive trend in analyzing competitive behavior firms in the in-vitro diagnostic substance manufacturing industry.

The second hypothesis tests the relationship between firms' complexity and change in market share gains. Results in Table 2 and in Model 3 show that if firms undertake more complex sets of different action types, they are supposed to achieve positive change in market share gains ( $B=0,141$ ,  $p<0,01$ ). Firms in the telecommunications sector use different technological capabilities in order to acquire and achieve wider geographical coverage and satisfy different customers' preferences in the area of service quality and new products. Bundling fixed broadband Internet with other telecom services gives them the freedom to launch different products, set different service prices and bind customers with different contract durations. The results presented above are consistent with other empirical and theoretical achievements (Ndofor *et al.*, 2015; Carnes *et al.*, 2019).

Model 5 in table 2 incorporates the interaction effects between the competitive repertoire and information about regulation status and suggests that a firm's aggressiveness and offer complexity positively and statistically significantly affect change in market share gains for non-regulated firms. On the other hand, regulated firms, even more relatively aggressive on the market, are faced with negative trends in market share changes.

We applied the Wald test in order to jointly test the significance for the total effects of independent variables on market share change. Results show that regulated and non-regulated firms differ in offer complexity and aggressiveness. Aggressiveness and offer complexity positively affect market share change for non-regulated firms, while the total effect is not statistically significant for regulated firms.

## 6. Discussion

Empirical research shows that competitive aggressiveness and competitive complexity positively impact market share growth in general. This conclusion is in accordance with other empirical and theoretical studies, such as papers from Andreovski & Ferrier (2016), Ferrier *et al.* (1999), Ndofor *et al.* (2015) and Carnes *et al.* (2019). Entering into a deeper analysis of competitive behavior of telecommunications firms, we find very specific and interesting results.

This paper suggests that competitive repertoire has different implications on market share gains for regulated and non-regulated firms. In fact, this conclusion brings the value added in competitive dynamics research and gives an effort to integrate other antecedents that define competitor behavior on the market. The results show that competitive intensity on the regulated fixed broadband market in 28 European countries positively influences market share gains for non-regulated firms, while this relationship is not positive for the regulated ones. Regulated firms are those with higher market shares. They use a rich resource portfolio, economy of scale, benefits of brand awareness and rich working experience (Woo & Cooper, 1981). Chen et al. (2010) find that very successful firms are not motivated to aggressively perform on established market, until they are attacked. Our results consider that firms with high market share act very aggressively on the market. One of the reasons can be their rich resource portfolio they activate in order to retain market position. Opposed to the larger ones, smaller firms are more flexible, have a flatter organizational structure, easily indulge into risk, they are proactive and very aggressive. Connelly *et al.* (2016) find that small firms constantly improve their performance measures. The obtained results can be compared with those from Andrevski & Ferrier (2016) who included internal firm factors and found that competitive aggressiveness is not the main key success. It is useful until additional competitive aggressiveness induces additional costs that diminish performance. Chen *et al.* (2012) split firms into large and small, based on the resources they use. They find that both can succeed by engaging in competitive activity, depending on the market on which they compete – new or already established. Smaller firms should focus on strategic moves that are not easily viewed by larger firms, trying to find a market niche and put the focus on activities that reduce costs of current products in the case of established markets. In the new markets they should avoid investments in R&D of new products because of negative implications on performance (Chen *et al.*, 2012).

Regulation process opened up a market for new entrants and introduced a new competitive dynamics on the market. Regulation limits former monopolies in their capabilities on the market. Consequently, many regulated firms in European countries are losing market share, mainly in the wealthier areas of large cities where they meet more competitive pressure from challengers.

The liberalization process induced technology diffusion, where companies are setting up their competitive strategies based on an inter-platform and intra-platform basis. Intra-platform competition is based on incumbents' networks, allowing challengers to lease infrastructure from incumbents and to differentiate from them based on service prices, while inter-platform competition is based on many other platforms which operators are using in order to gain competitive advantage and differentiate themselves from incumbents (frequently used technologies are based on coax cable and fiber optics). For example, in Croatia, the com-

pany A1 (former Vipnet) invests into its own infrastructure (cable network and Satellite) and buys wholesale services from the incumbent (Bitstream and ULL). The investment strategy gives them more freedom to reconfigure their technological solutions and concentrate more attention on targeted customers in certain parts of the country that seem more profitable (larger cities), while services based on incumbent's network enable them to acquire a larger customer base by offering services at lower prices that are supposed to migrate into their privately owned technological solution. A1 recorded positive changes in market share gains on a year-on-year basis (2010-2013). On the other hand, the incumbent T-HT possesses a rich resource portfolio, the capability to exploit it and knowledge and experience on the market. The regulation process limits them in the pricing strategy, allowing other operators to enter the market. As a consequence, they are losing market share on a year-on-year basis, despite the competitive intensity.

This empirical research analyzes a quite specific market segment in the telecommunications industry – fixed broadband. Specificity is in quite strong rules imposed mainly on former incumbents by independent regulatory agencies and the fact that firms compete in the same market under different rules. Additionally, empirical research is based on the analysis of competitive moves and their impact on performance indices based on more than two firms on each analyzed market, which put additional value to the competitive dynamics research.

### *Managerial implications*

The consulting company EY used to conduct interviews with senior industry executives in the telecommunications sector at the global level. Results for 2012 show that the key issues the operators face in the telecommunications sector are as follows: Capex demand due to data growth, the need to improve margins, regulation, spectrum availability and increased competition (EY, 2012). Only three years later, the most significant challenges that the industry is facing are (EY, 2015): disruptive competition, uncertain regulatory environment, ect. The key issues for the above mentioned analysis are investments, regulation and competition. In European countries, new entrants are continuously gaining positive effects on market share gains, but the incumbent operators still control more than 40% of customer subscriptions (EC, 2014). Empirical studies across 28 European countries take into consideration a positive relationship between competitive aggressiveness and complexity with market share growth for non-regulated firms. This signals that challengers should focus on competitive intensity strategy and direct more attention to different types of competitive moves. They have the opportunity



on the market and, by efficiently managing their costs, they can achieve a higher market share and improve profitability. Regulated firms are under the magnifier of a regulatory agency that cope with opposed objectives. They should think about a more balanced connection between market share and competitive activity. The strategy of competitive aggressiveness and complexity is acceptable only if it does not incur additional costs. Expenditures are admissible only for an action that retains or improves their market share and profitability. Moreover, the strategy to open some new markets is a promising strategy, especially the ones that avoids regulation.

### *Limitations and future directions*

The above presented results of the empirical study undoubtedly contribute to the competitive dynamics research stream, but with some limitations. First of all, market share is a performance indicator without dramatic changes over a three-four year period. It could be useful to include a longer studied time period and to analyze competitive behavior among competing firms and their consequences on firm market share. This research focused only on one performance indicator, although very important in the regulated telecommunications sector. Future research can add value to competitive dynamics research by other firm performance indicators, such as the return on sale measure. It could be very interesting to analyze profit margins of challengers, especially those that are fully dependent on incumbents' network offered on wholesale level.

Incumbents have their hands tied in many segments of business on retail level, such as strong price controls by regulatory agencies and challenges with profit margins. However, some of them established smaller companies that use wholesale services by the incumbent under the same conditions as any other challenger. In that way they disperse risks and set different competitive strategies in order to acquire customers. Moreover, through those firms incumbents can challenge performance measures by other competing firms on the market. It could be very interesting to study how incumbents are trying to somehow avoid strict pricing rules imposed on retail offers and to compete more flexibly on the market.

The above presented results show that imposed regulation has different consequences for different firms. Unregulated firms benefit on the market by using a more aggressive and more complex set of competitive moves. For future research it could be interesting to investigate what specific kind of regulatory obligation impacts different strategic options for regulated and non-regulated firms.

## 7. Conclusion

This research contributes to the competitive dynamics research stream. A longitudinal study of firms from the telecommunications industry examines the influence of the competitive action repertoire concept on market share gains. The key finding is that in the regulated telecommunications sector competitive action repertoire positively impacts change in market share gains in general, but that the effect is different for regulated and non-regulated firms. Competitive aggressiveness positively impacts the year-on-year market share growth for non-regulated firms, while there is a negative effect for regulated ones. Offer complexity has a positive impact on the year-on-year market share growth for non-regulated firms. Regulated firms are faced with a negative effect, but that effect is statistically insignificant. The regulation process opened up the incumbent's network and intensified rivalry on the market.

## References

- Aiken, L. S. & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park: Sage.
- Amstrong, S.J. & Collopy, F. (1996). Competitor Orientation: Effects of Objectives and Information on Managerial Decisions and Profitability; *Journal of marketing research*, Vol 33 (2), 188-199.
- Andrevski, G. & Ferrier, W.J. (2016). Does It Pay to Compete Aggressively? Contingent Roles of Internal and External Resources. Available at: [https://www.researchgate.net/profile/Goce\\_Andrevski2/publication/310659030\\_Does\\_It\\_Pay\\_to\\_Compete\\_Aggressively\\_Contingent\\_Roles\\_of\\_Internal\\_and\\_External\\_Resources/links/5a54eaca45851547b1bd5019/Does-It-Pay-to-Compete-Aggressively-Contingent-Roles-of-Internal-and-External-Resources.pdf](https://www.researchgate.net/profile/Goce_Andrevski2/publication/310659030_Does_It_Pay_to_Compete_Aggressively_Contingent_Roles_of_Internal_and_External_Resources/links/5a54eaca45851547b1bd5019/Does-It-Pay-to-Compete-Aggressively-Contingent-Roles-of-Internal-and-External-Resources.pdf) (March 2018).
- Andrevski, G., Richard, O., Shaw, J., & Ferrier, W. (2014). Racial diversity and firm performance: The moderating role of competitive intensity. *Journal of Management*, 40: 820-844.
- Armstrong, J.S. & Green, K.C. (2007). Competitor-Oriented Objectives: Myth of Market Share. *International Journal of Business*, Vol. 12, pp. 117-136, Available at SSRN: <https://ssrn.com/abstract=988441>.
- Armstrong, M., Cowan, S., & Vickers, J. (1994). *Regulatory reform: Economic analysis and British experience*. Cambridge MA: MIT University Press.

- Baum, J. A. C. & Korn, H. J. (1996). Competitive dynamics of interfirm rivalry. *Academy of Management Journal*, 39, 255–271.
- Carnes, C. M., Xu, K., Sirmon, D. G. & Karadag, R. (2019). How Competitive Action Mediates the Resource Slack– Performance Relationship: A Meta-Analytic Approach. *Journal of Management Studies*, 56(1), 57-90.
- Chen, M-J., Lin, H.C. & Michel J. G. (2010). Navigating in a hypercompetitive environment: The roles of action aggressiveness and TMT integration. *Strategic Management Journal*, 31, 1410-1430.
- Chen, E. L., Katila, R., McDonald, R., & Eisenhardt, K. M. (2010). Life in the fast lane: Origins of competitive interaction in new vs. established markets. *Strategic Management Journal*, 31, 1527-1547.
- Chen, M.J. & Miller, D. (2012). Competitive dynamics: themes, trends, and a prospective research platform. *Academy of Management Annals* 6(1): 135–210.
- Chen, M-J. & Hambrick, D. C. (1995) Speed, stealth, and selective attack: How small firms differ from large firms in competitive behavior. *Academy of Management Journal*, 38(2), 453 482.
- Chen, M-J. & Hambrick, D. C. (1995). Speed, stealth, and selective attack: How small firms differ from large firms in competitive behavior. *Academy of Management Journal*, 38(2), 453 482.
- Connelly, B. L., Tihanyi, L., Ketchen, D. J., Carnes, C. M. & Ferrier, W. J. (2016). Competitive repertoire complexity: Governance antecedents and performance outcomes. *Strategic Management Journal*, 38, 1151–1173.
- D’Aveni, R. A. (1994). *Hypercompetition: Managing the dynamics of strategic maneuvering*. New York: Free Press.
- Derfus, P. J., Maggitti, P. G., Grimm, C. M., & Smith, K. G. (2008). The Red Queen effect: Competitive actions and firm performance. *Academy of Management Journal*, 51, 61-80.
- EC. (2014). Broadband Internet Access Cost (BIAC) study, available at: <https://ec.europa.eu/digital-single-market/en/news/broadband-internet-access-cost-biac-study> (March 2014).
- EY. (2015). Global telecommunications study: navigating the road to 2020. available at: [https://www.ey.com/Publication/vwLUAssets/ey-global-telecommunications-study-navigating-the-road-to-2020/\\$FILE/ey-global-telecommunications-study-navigating-the-road-to-2020.pdf](https://www.ey.com/Publication/vwLUAssets/ey-global-telecommunications-study-navigating-the-road-to-2020/$FILE/ey-global-telecommunications-study-navigating-the-road-to-2020.pdf) (Prosinac 2018).
- Ferrier, W. (2001). Navigating the competitive landscape: The drivers and consequences of competitive aggressiveness. *Academy of Management Journal*, 44, 858-877.

- Ferrier, W. J. and Lee, H. (2002). 'Strategic aggressiveness, variation, and surprise: How the sequential pattern of competitive rivalry influences stock market returns'. *Journal of Managerial Issues*, 14, 162–80.
- Ferrier, W., Smith, K., & Grimm, C. (1999). The role of competition in market share erosion and dethronement: A study of industry leaders and challengers. *Academy of Management Journal*, 42, 372-388.
- Gale, B.T., & Buzzel, R.D. (1993). Market position and competitive strategy; in Day et al., *The Interface of marketing and strategy*, JAI Press, Greenwich, CT.
- Gimeno, J. & Woo, C. Y. (1996). 'Hypercompetition in a multimarket environment: The role of strategic similarity and multimarket contact in competitive de-escalation'. *Organization Science*, 7, 322–41.
- Grimm, C. M., & Smith, K. G. (1997). *Strategy as action: Industry rivalry and coordination*. Reading, MA: Southwestern.
- Hausman, J. (1978). Specification tests in econometrics. *Econometrica*, 46, 1251-1271.
- Hughes-Morgan, M & Ferrier., W. J. (2014). Competitive Action Repertoires and Stock Risk. *Journal of management Issues*, XXVI (1), 55-69.
- Hughes-Morgan, M., Ferrier., W. J. & Morgan, F. W. (2018). Competitive Action Repertoires and Stock Risk. *Journal of management Issues*, XXVI (1), 55-69.
- Jacobson R. (1992). The "Austrian" school of strategy. *Academy of Management Review*, 17, 782-807.
- Katila, R. & Chen, E.L. (2008). Effects of search timing on innovation: the value of not being in sync with rivals. *Administrative Science Quarterly*, 53(4), 593-625.
- Katila, R., Chen, E. L. & Piezunka, H. (2012). All the right moves: How entrepreneurial firms compete effectively. *Strategic Entrepreneurship Journal*, 6, 116-132.
- Kay, J. (1993). *Foundations of Corporate Success: How Business Strategies add Value*, Oxford University Press, Oxford.
- Lee, J. (2017). A Review of Competitive Repertoire-Action-Based Competitive Advantage. *International Journal of Business and Management*. 12(11), 120-129.
- Lieberman, M.B. & Montgomery, D.B. (1998). First-mover (dis)advantages: retrospective and link with the resource-based view, *Strategic Management Journal*, 19(12), 1111-1125.
- Makadok, R. (1998). Can first-mover and early-mover advantages be sustained in an industry with low barriers to entry/imitation? *Strategic Management Journal*, 19, 683-696.

- Makador, R. (1999). Inter firm differences in scale economies and the evolution of market shares. *Strategic management Journal*, 20(10), 935-952.
- Miller, D. & Chen, M.-J. (1996). Nonconformity in competitive repertoires: A sociological view of markets. *Social Forces*, 74, 1209-1234.
- Miller, D. (1993). The Architecture of Simplicity. *Academy of Management Review*, 18(1), 116-138.
- Miller, D. & Shamsie, J. (1996). The resource-based view of the firm in two environments: The Hollywood film studies from 1936-1965. *Academy of Management Journal*, 39, 519-543.
- Miller, D., & Chen, M.-J. (1994). Sources and consequences of competitive inertia: A study of the U.S. airline industry. *Administrative Science Quarterly*, 39(1), 1-23.
- Mische M. A. (2001). *Strategic Renewal: Becoming a High-Performance Organisation*, Prentice Hall, Englewood Cliffs, NJ.
- Nadkarni, S., Chen, T. & Chen, J. (2015). The clock is ticking! Executive temporal depth, industry velocity and competitive aggressiveness. *Strategic Management Journal*, 37(6), 1132-1153.
- Ndofor, H. A., Sirmon, D. G. & He, X. (2011 ). Firm resources , competitive actions and performance: Investigating a mediated model with evidence from the in vitro diagnostics industry. *Strategic Management Journal*, 32, 640-657.
- Ndofor, H. A., Sirmon, D. G. & He, X. M. (2015). 'Utilizing the firm's resources: How TMT heterogeneity and resulting faultlines affect TMT tasks'. *Strategic Management Journal*, 36, 1656-74.
- O'Regan, N. (2002). Market share: The conduit to future success? *European Business Review* , 14(4), 287-293.
- Pejić Bach, M., Zoroja, J. & Jirouš, Ž. (2013). Croatian telecommunication market: concentration trends in the period from 2003 to 2008. *Interdisciplinary Description of Complex Systems* 11(1), 131-142.
- Porter, M. E. (1979). The structure within industries and companies' performance. *Review of Economics and Statistics*, 61, 214-227.
- Rindova, V., Ferrier, W.J. & Wiltbank, R. (2010). Value from gestalt: How sequences of competitive actions create advantage for firms in nascent markets. *Strategic Management Journal*, 31, 1474-1497.
- Schumpeter, J. (1950). *Capitalism, Socialism, and Democracy* (3rd edn). Harper & Row: New York.
- Smith, K. G., Grimm, C. M., Gannon, M. J. & Chen, Ming-Jer. (1991). Organizational Information Processing, competitive Responses and Performance in the US Domestic Airline Industry. *Academy of Management Journal*, 34(1), 60-85.

- Smith, K.G., Ferrier, W.J. & Ndofor, H. (2001). Competitive dynamics research: Critique and future directions. In M.A. Hitt, Freeman, R.E., and Harrison, J.S. (Eds.), *The Blackwell Handbook of Strategic Management*. Malden, MA: Blackwell Publishers Ltd.
- Winston, C. (1993). Economic deregulation: Days of reckoning for microeconomists. *Journal of Economic Literature*, 31(3), 1263–1289.
- Woo, C.Y. & Cooper, A.C. (1983). Evaluation of strategies and performance of low ROI market share leaders, *Strategic Management Journal*, 4, 123-135.
- Yang, W. & Meyer K. E. (2015). Competitive Dynamics in an Emerging Economy: Competitive Pressures, Resources, and the Speed of Action, *Journal of Business Research*, 68, 1176 1185.
- Young, G., Smith, K. G. & Grimm C. M. (1996). “Austrian” and Industrial Organization Perspectives on Firm-level Competitive Activity and Performance. *Organization Science*, 7(3), 243-254.
- Yu, T., Subramaniam, M. & Cannella, J. A. (2009). Rivalry deterrence in international markets: Contingencies governing the mutual forbearance hypothesis. *Academy of Management Journal*, 52(1), 127-147.

## KONKURENTSKI REPERTOAR PODUZEĆA U TELEKOMUNIKACIJSKOJ DJELATNOSTI

### Sažetak

Rad prikazuje kako konkurentski repertoar poduzeća i eksterno regulatorno okruženje utječu na uspješnost poduzeća u reguliranoj telekomunikacijskoj djelatnosti. Na temelju panel analize podataka na 103 poduzeća koja pružaju uslugu fiksnog pristupa Internetu krajnjim korisnicima u zemljama Europe i u vremenskom promatranju kroz tri godine, rezultati pokazuju da konkurentska agresivnost i kompleksnost poduzeća pozitivno utječu na rast udjela na tržištu. Za razliku od općeprihvaćenog mišljenja, rezultati empirijskog istraživanja pokazuju da najagresivnija poduzeća zapravo gube tržišni udio iz godinu u godinu. Kompleksnost i konkurentska agresivnost pozitivno utječu na promjenu udjela na tržištu kod nereguliranih poduzeća, dok to nije slučaj kod reguliranih poduzeća.

Ključne riječi: konkurentska dinamika, konkurentski repertoar, regulacija, telekomunikacijska djelatnost, fiksni pristup Internetu