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Abstract

This paper analyses the development of the television (TV) markets in Germany and Croatia from previous times of monopoly to the current situation of oligopoly. This paper presents trend data pertaining to the market shares of each TV channel, allowing for the calculation of market concentration indicators (concentration ratio C3 and the Herfindahl-Hirschmann index) on two levels: the level of channel and the level of the group. This demonstrates the difference in the fall of market concentration - despite the increasing number of channels and a significant decrease in the level of concentration on the level of the channel, the concentration of the group level decreases at a much slower rate. Using annually recorded data, this paper estimates eight trend models for market concentration in the German and Croatian TV markets. In both countries, three leading groups control 80 to 90 percent of the entirety of the TV market. Similarities in the German and Croatian TV markets are characteristic of the oligopolistic market structure, in which there are three main players and a larger number of smaller participants.

Key words: television, market power, concentration, trend models, Germany, Croatia.

1. Introduction

Through processes of liberalization and deregulation, the TV marketplace has become dynamic and unpredictable. The emergence of private TV stations has ended the monopoly of public TV stations, which were pioneers in transmitting TV programmes in each respective country. This paper analyses the development of the TV market in Germany as a country representing “old Europe”, and conversely uses Croatia as a country representing “new Europe”. Both of these countries began with a public TV monopoly, and today have liberal TV markets which stretch from oligopoly to monopolistic competition. These markets are similar to other European TV markets, and so this analysis can serve as the basis for any other European country, depending on whether it is from “old Europe” (following the same pattern as Germany – mostly countries from Central Europe) or “new Europe” (following the same pattern as Croatia – mostly countries from the South-eastern region of Europe). The aim here is to compare the development and the current situation of these two markets, while simultaneously developing models to predict market power. Havick (2000) compared, recognizing structures of the Internet an discussed how it differentiate from television- It is important to point out that the analysis includes the linear television, and not the streaming services or other Internet-based video services, which are not considered part of television market, although they could influence TV market indirectly.

In recent years, merger and acquisition (M&A) activity in TV broadcasting and distribution has been heating up. Consolidation in these industries basically follows a cyclical pattern, with economic and regulatory conditions accelerating or slowing down M&A activity (Evens, Donders, 2016). These processes are also one of the factors that can influence the change of market power on the television market. M&A activities are much more common in television distribution, than in television broadcasting.

German and Croatian TV markets display many similarities. Three main TV groups dominate both of these markets. When comparing the German TV Market of around 20 years ago with the current Croatian market, obvious similarities emerge in terms of the number of nationwide channels. However, Croatia does not lag behind Germany in all cases. The process of digitalization of terrestrial signal (DVB-T) started in Germany and in Croatia in 2002. The second part of terrestrial digitalization (DVB-T2 system) began in Croatia in 2019; only two years after Germany. Additionally, Croatia was the first country to adopt a h.265/HEVC system after Germany. Currently, only Germany and Croatia use this completely new system of terrestrial broadcasting.

After the introduction and the literature review, an overview of the development of TV markets in Germany and in Croatia is given. Tables are used to point out the market shares of TV channels in Germany from 1983 to 2018 and in Croatia from 2002 to 2018. Mindful of the gaps in existing academic literature, contributions are formulated. The main contributions of the article to extant literature are threefold. This is the first time in scholarly literature that such an extended time frame has been considered. Based on this data, this paper conducts an analysis of the market

concentration for both countries. The results are eight trend models (4 for each country), which can be used to pre[Journal Pre-proof]also for the audience in general.

The main research questions in this paper are how the television markets in Germany and Croatia have been developing from monopoly towards oligopoly and further monopolistic competition, what are the similarities between these markets in the terms of market power and market concentration and finally how can we predict the future trends in these two television markets. Imperfect competition markets, such as oligopoly and monopolistic competition are characterized by transaction costs. Transaction costs act as fixed costs which increase the optimal production scale similarly to advertising (Coase, 1937), moving the average cost curve up. Coase (1937), Williamson (1979), Transaction costs affect the behavior of economic agents (Coase, 1937, Williamson, 1979). Williamson (1989) claims that different types and levels of transaction costs bring about different types of institutional arrangements and market organization.

2. Literature review

The literature review presents the main research conducted in terms of the development of the German and Croatian TV markets. The majority of academic literature pertains to Germany. However, there is a huge deficit in literature analysing the Croatian TV market. This overview is chronological; firstly examining Germany, and then Croatia.

Hadamitzky, Von Blanckenburg, and Backhaus (2007) identified alternative allocation policies for public broadcasting. Assuming a public service mission, public broadcasting should be treated as a pure public good and should thus be funded via a compulsory levy. Questioning the public service mission, public broadcasting represents a club good, which should be funded via the voluntary contributions of actual users. To accomplish this, country-wide digitalization is necessary, which has been realized in Germany since 2010.

Kolmer and Semetko (2010) discussed the key characteristics of the German public service broadcasting system and compared the quantity of foreign affairs news in evening news programs on the public service (ARD and ZDF) and private channels (RTL and SAT.1) from 2001 to 2007. While the amount of foreign affairs news ebbs and flows, it remains substantial and within the range of 40 to 50 percent of the programs on both the public service and the private channels.

Förster's (2012) research stemmed from the fact that the functions of media brands, from an audience and managerial perspective, have been the subject of controversial discussions among scholars. However, in previous studies, scholars have focused on singular elements of media branding; such as the influence of programming strategies on TV brands, the effects of brand images on TV news, or media referring content as a communication instrument for media corporations. However, current research lacks a holistic view of the TV branding process, which includes both strategic and tactical perspectives. Thus, the purpose of the study is to identify key success factors of TV brand management by analysing ten different TV brands in the United States, the United Kingdom, Spain, and Germany.

Felgenhauer (2013) analysed strategic regionalization and the German regional public broadcasts. Broadcasting stations, TV programs, and newspapers transform all topics of interest by placing them within a regional context. In Germany, the federal states' public broadcasting stations exist to provide a regional framework for news and entertainment. Most strikingly, certain TV series present narratives of a region's history that override its current territorial shape. This article examines similar TV series from three regional public German broadcasting stations, focusing respectively on the histories of Mitteldeutschland (Middle-Germany), Bayern (Bavaria), and Brandenburg. Based on the qualitative analysis of data derived from these programmes, it is argued that simulated authenticity, linked to a rhetoric of naturalization, are crucial elements in policies of 'top-down regionalization'.

Lombao and Freire (2013) analysed social responsibility in public European radio-television corporations. Corporate social responsibility is the voluntary commitment to responsible and measurable behavior of an enterprise beyond the provisions of the laws to meet the expectations of the stakeholders with which it interacts. This management model was created to solve problems related to the reputations and credibility of private companies, although

recently it was assumed by publicly owned organizations. At the European Union, the state publicly owned brorate social responsibility actions, even without following international or state regulations.

Herrmann (2013) discussed the financial systems of public media in Germany. Germany is characterized by a dualism between public and private broadcasting and license fees mainly finance public broadcasting services. The former broadcasting fees were replaced in 2013 by a monthly broadcasting contribution, paid by every household and company regardless of the extent to which they use public broadcasting services. The new system resulted in higher fees for many people and a controversial public dispute. This paper highlights some potential ways in which the current financing system could be improved.

Ramiro (2015) analysed the status of the German media. The guarantee of pluralism and the formation of a free public opinion has had the biggest impact on the German model of the legal regulation of the media. After the dramatic experience of the Second World War, as an essential element of its democratic structure, Germany ensured the guarantee of freedom in the media. The model of media regulation created for this purpose, based on a dual system of broadcasting which requires the inclusion of institutions with both organizational and democratic functions and a system of "mixed" financing, make Germany a good point of reference in terms of the independence of the media faced by many governments and public authorities.

Thomas (2016) analysed transparency in the public media service in Germany. It is argued that the concepts of civil society and transparency are interrelated, and so this paper reviews the role of civil society in modern democracies and looks at how and with what benefits public service media can relate to it. It is shown that two different interpretations of civil society – a moderate one and an emphatic one – are at the base of the German case regarding the reform of the broadcasting council. Using Germany as an example, civil society and transparency are discussed in relation to normative orientations for public service media in Europe.

Túñez-López and Costa-Sánchez (2018) focused on analysing the management of online communication interactions as a method through which to generate public value. European public broadcasters' webs and social media policies were studied. The paper pays particular attention to European public broadcasters' corporate content and biographical information in order to approach the transparency, honesty, and social commitment levels that influence their reputation. The study's aim is to identify social media policies in a public environment and, preferably with regards to the main European broadcasters, analyse their contribution to the creation of public value associated with their image. To analyse interactivity, a sample of seven public TV stations were used: RTVE (Spain), France Télévisions (France), RAI (Italy), BBC (Great Britain), RTP (Portugal), and ARD/ ZDF (Germany). To assess social media guidelines, a comparison of European TV stations with communication referential entities from the United States and Canada was developed.

The Croatian TV market is very poorly covered in scholarly literature. Roller (2014) analyses the development of the Croatian TV market over the last decade, focusing especially on the changes that have been taking place since 2009 and their effect on the diversity and pluralism of TV programmes. The study presents the data on the structural diversity of the Croatian TV market which reached its peak in the second decade of the 21st century, as the processes of privatization and commercialization had been completed. The research includes data and the analysis of the TV audience distribution during the last few years, showing the major changes regarding the position of the public service broadcaster, which occurred during that time. Content pluralism and diversity of the TV programmes were analysed, using data on the genre structure of the main national broadcasters - one public and two commercial - with an emphasis on news and current affairs genres as well as the other high social value programmes regarded as content of public interest. The genre structures and distribution of the overall national TV programme output were considered in relation to each genre's audience ratings, exposing the gap between the "supply" of the programmes offering content of public interest and the audience's "demand", expressed by the total audience share, which could be considered a guideline for media policies and regulation. In the conclusion, the potential of TV pluralism and diversity as a possible tool with which to enhance the democratic functions of the media in Croatia are identified, along with the need for further audience research to explore the complex relationship between genres and audience expectations, needs, and choices.

Galetić, Dabić, and Kiessling (2016) have also analysed the Croatian TV market. They found that the TV market can repr[Journal Pre-proof]nter the market. The entry of competition changes the market from monopolistic to oligopolistic, which has positive performance implications for the industry. The research analyses the development of the Croatian TV market from the monopolistic stage to the current oligopolistic stage. Econometric models in this article aim to estimate the current trends in market concentration and its future potential. The research focuses on the industry from a market concentration perspective, and provides guidance for practitioners with regard to profitable investment opportunities. This study also illustrates, for other transitional economies, that in order to move towards a "free" society, the media must be free from governmental control. This will evolve rapidly once privatized.

It is also important to have in mind the competition between television and Internet, in terms of the access to television contents online. The likely future impacts of the Internet are examined by Havick (2000) in the following investigatory steps: a comparison of the properties of the Internet to those of television, a consideration of the functional performance of the Internet and television and an examination of the impact of the Internet on a television society. The Internet expands individual freedom and capability to communicate, which in turn results in greater news gathering and interpretative communication among the masses of individuals. Increased specialization, fragmentation, individualization, and decentralization of societal activity will cause stress to social, economic, and political institutions. Eventually society will adjust to the new communications culture, but it will be a substantially different society from that dominated by television. In an era in which independent journalism is flourishing in social media and appears to be changing the world of journalism, it is important to understand and identify how the culture of online journalism differs from the features of traditional journalism (Laor, Galily, 2020). Social media can also be partly treated as the potential competition to television (Ramadani et al., 2014; Palalic et al., 2020), especially within the younger population. This are the topics that will become more and more important in following years and the impact of Internet on television audience will increase.

3. Television market development in Germany

The history of TV broadcasting in Germany began in 1935, when Fernsehsender Paul Nipkow started to broadcast as the first public TV station in the world. In 1936, the programme was extended to various events, films, shows, news, and Olympic Games, which took place in Germany (Uricchio, 1990). This was the start of regular programming (Gumbert, 2014). At the start, around 200 receivers were sold, mostly in Berlin (Kreuzer, 1979). TV in Germany started to develop quickly, serving as an important medium of national socialist propaganda (Hoff, 1990). But the invasion of Poland cut short the further spread of TV; government plans for mass production of the "Unity Television" (Einheitsfernseher), scheduled to begin 1st September 1939, never transpired. Public viewing in Germany quickly ended, and most of the existing TV receivers ended up in the hands of government officials (Gumbert, 2014). After World War II, plans for reconstructing the whole media system in Germany, especially radio and TV, began immediately. Allied forces seized media facilities across the country, repairing damaged transmitters and equipment (Kleinsteuber and Wilke, 1992). The first transmissions began in 1945 and 1946.

As a result of the German division after the Second World War, the history of German TV continued in different ways. Both the Federal Republic of Germany and the German Democratic Republic began broadcasting TV programmes in 1952 (Beutelschmidt, 2001). In the Federal Republic of Germany, the United States of America, the United Kingdom, and France founded ARD (Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten Deutschlands - Cooperative association of the public broadcasters in Germany). In the German Democratic Republic East, the Soviet Union founded DFF (Deutscher Fernsehfunk – German television). Many parts of Germany, particularly regions in the east, received signal from both services. This paper will focus on the West German TV market.

In the 1960s, the TV market in Germany obtained more TV stations. In 1963, the long-promised second TV network began under the name of ZDF (Zweites Deutsches Fernsehen - Second German Television). At the same time, several regional TV stations began to transmit programmes. They are known as "die Dritten" (the Thirds). In the mid-1960s, there were 5 regional TV stations: Nord 3, West 3, Hessen 3, Bayern 3, and Südwest 3. The oligopoly of only three TV

channels (which was at the same time the monopoly from the aspect af ownership – all three channels were state owr

The regulations in Germany did not allow any private TV stations in the beginning of 1980s. The first private TV station in Germany was PKS (Programmgesellschaft für Kabel- und Satellitenrundfunk), which started broadcasting on the 1st January 1984 but, as a cable TV channel, it was only available to around 1,200 households in the cities of Ludwigshafen and Munich (Blumler and Nossiter, 1991). A year later, it was renamed Sat 1, the name under which it still operates today. The other TV channel was RTL plus and it was launched only one day after PKS, on 2nd January 1984 (Noam, 1991). Unlike PKS, RTL plus was not transmitted by cable, but by air, as a terrestrial channel. This was made possible (although German regulations still did not allow this at that time) by its location: RTL plus was broadcasted from Luxembourg, hence the name Radio Television Luxembourg. The audience consisted of around 200,000 viewers (Blumler and Nossiter , 1991), mostly in areas close to the border with Luxembourg. The popularity of these channels led to the speedy development of cable TV for the whole country in 1985. However, as cable TV is limited in its infrastructure, these two channels turned to satellite broadcasting. Sat 1 began satellite broadcasting in 1985, and RTL plus, which changed its name to RTL, began in 1986 (Hitt and Ireland, 2007).

The satellite broadcasting of both Sat 1 and RTL led to the widespread distribution of these channels. They were redistributed in cable systems in the whole of Austria, Switzerland, and western Germany. Despite substantial financial support, Sat 1 experienced major difficulties which impaired its success: its audience was smaller than envisaged because of the slow development of cabling, poor advertising revenues, technical problems with satellite broadcasting, and substantial differences between the laws of the west German states (Bundesländer) in terms of advertising (Blumler and Nossiter, 1991). RTL faced similar problems. For both channels, the revenue from advertising was much lower than expected. The launch of the first Astra satellite in 1988 presented an improvement over former satellite systems and supported the development of direct (individual) satellite reception (Hitt and Ireland, 2007). From then onwards, Astra satellite has been the most important type of satellite for Germany.

Although satellite broadcasting was extremely expensive, and public TV also wanted to start satellite broadcasting, Germany, Austria, and Switzerland started a joint satellite channel under the name of 3 Sat in 1984. It was a cooperative network by Germany's ZDF, Austria's ORF, and Switzerland's SRG SSR. Later, in 1993, German ARD also entered this network.

The liberalization of the TV market and the increase in revenue from advertising, as well as a better developed infrastructure (cable and satellite), meant that the market began to attract new entries. From 1989 to 1993, several new private TV stations appeared on the market. They were mostly new channels from the owners of Sat 1 and RTL. In 1989, in the Sat 1 group, Pro 7 appeared and, in 1992, Kabel 1. The RTL group started with n-tv in 1992 and RTL 2 and Vox in 1993.

The first half of the 1990s was the golden age for German satellite TV. Numerous TV channels started to broadcast via satellite, and prices of satellite dishes for private reception lowered, meaning that the average German could afford it. Public TV channels also began to broadcast via satellite. The most important satellite for German TV channels is Astra 1, at an orbital position of 19.2° east. The process of digitalization in the terrestrial TV network enabled many TV stations to broadcast on the dvb-t (later dvb-t2) system. The development of technology and the liberalization of the market led to the current situation, in which there are 223 TV channels registered at a national level in Germany (Kommission zur Ermittlung der Konzentration im Medienbereich, 2018). Most of the German TV market can be divided into three groups: public TV, RTL group, and ProSiebenSat.1 group.

4. Television market development in Croatia

The history of TV in Croatia began in 1956 when the first TV station started to broadcast TV programmes (Croatian Radio Television, 2009). It was broadcasted from the peak of Mount Medvednica (Sljeme) to the town of Zagreb. In the same year, TV experienced the first live event in Croatia – the opening of the Zagreb International Fair. The second TV channel started experimentally in 1966 and regularly in 1972 (Ahačić-Kalinić et al., 2016). The names of these channels were Televizija Zagreb 1 (TVZ 1) and Televizija Zagreb 2 (TVZ 2). In 1988, public TV manifested the first local channel for the area of Zagreb, called Z3 (Ahačić-Kalinić et al., 2016). After the breakup of Yugoslavia (in

which Croatia was one of six republics), Televizija Zagreb (TVZ) was renamed to Hrvatska Radiotelevizija (HRT, Cro

The first commercial TV channel started broadcasting in 1989. Its name was OTV (Omladinska televizija – Youth television). The name was later changed to Otvorena televizija (Open Television) and, after that, it became Jabuka TV (Apple TV). In the entire history of Croatian TV, it has remained the local TV station for the area of city of Zagreb and its neighborhood which broadcasts mostly its own TV programmes, such as information, music, and TV sales. OTV was the first independent TV station in the former Yugoslavia and one of the first in Europe. Due to the very small market share it is not included in our analysis.

HRT was monopolist at a national level up until the millennium. In November 2000, the first commercial TV station at a national level, Nova TV, started to transmit programmes. In the beginning it was owned by a Croatian investor and, in 2004, it was taken over by CME (Central European Media) and experienced a significant rise in ratings.

In line with a decision adopted by the Croatian Government, HRT lost its third channel in 2004. The third channel of HRT was privatized and this was the start of the second private TV station at a national level – RTL. From that time on, the Croatian TV market has had three main players – HRT, Nova, and RTL.

In 2011, the Croatian national TV market became 4 thematic TV channels richer – Doma TV (owned by Nova Group), RTL 2 (owned by RTL Group), CMC (Croatian Music Channel), and SPTV (Sport television). In 2012, HRT started the third and the fourth TV channel: HRT 3, as the channel for culture and education; and HRT 4, as the news channel. In 2013, RTL started the thematic channel for children, under the name RTL Kockica.

Today, the Croatian TV market is composed of 11 national TV channels, of which 9 are owned by three major groups: HRT, Nova, and RTL. These are the three main players in the market, which have the vast majority of shares – around 80% collectively. There are also around 20 local TV stations, which have very low share at a national level, as well as satellite and cable TV channels for which, unfortunately, there exists no data concerning shares.[1] Because of the lack of such data, but also because of the very low market share that these channels have, they are not included in this analysis.

5. Methodology and data

In the empirical part of this paper, data concerning market shares for TV channels in Germany and Croatia is shown. This data was collected from different German (Meedia, 2014; Steen, 2001; Mast, 1999; Medienmaerkte, 2005; Oliver, 1997; Bente and Fromm, 2013) and Croatian (Agencija za elektroničke medije, 2018; ARM, 2013) publications and websites. This constituted the most difficult challenge of this paper. Because there no time series data exists for the TV market, everything was collected manually year by year. This paper presents a time series for the German TV market from 1983 to 2018, and for the Croatian TV market from 2002 to 2018. This is the first time in scholarly literature that such long time series (36 years for Germany and 17 years for Croatia) has been presented and analysed.

The analysis of market concentration is based on two of the most commonly used indicators: Herfindahl-Hirschmann index and concentration ratios C3.

The Herfindahl-Hirschmann index (HHI) is calculated as the sum of the squares of market shares of each unit in the market. Its value can range from 0 to 1, where 1 indicates monopoly, and 0 shows perfect competition. Markets with a HHI lower that 0.1 are considered to be of low concentration, those with a HHI between 0.1 and 0.18 are moderately concentrated, and a HHI over 0.18 indicates a high concentration. In the evolution of the TV market, the starting point is always 1, and it then changes along with the development of the market if it starts falling.

[1] The only available data concerning these TV channels is from 2014, 2015, and 2016, which is not sufficient to warrant inclusion in this paper's analysis. Out of all of these other TV channels, only one had a share that was slightly over 1%. All others had shares of under 0.62%.

Concentration ratio C3 shows the share of the three largest units in the total market. It is calculated as the combined sum[boilerplate: Journal Pre-proof]tion. Theoretically, the value of C3 can range from 0% to 100%, where 0% would mean the perfect competitive market, and 100% would mean oligopoly with only 3 participants. The TV markets' starting point is 100% and, with development and liberalization, this value starts falling.

This paper shows trends in market concentration measured by both of the aforementioned indicators. Additionally, this paper will calculate these twice: once in terms of the level of every single TV channel, and once in terms of the level of the groups that own more TV channels.

6. Concentration of the television market

The main feature of the liberalization of the market is the fall of market concentration. This also appears to be the trend of the TV market. With the emergence of new competitors, the total market is being divided by a larger number of TV channels, and the market concentration has thus begun to fall. The starting point is always monopoly, in which one channel makes up the whole market. In such a situation, the share of this channel is 100%, and the HHI is 1.

Market concentration is a very complex topic. On one hand, TV stations try to increase their market power and the level of concentration, and on the other hand the viewers would like to have more diverse choice which can only be achieved by adding more channels and lowering the concentration. This is also an important question for policy makers – how high level of concentration should be tolerated on the market? There is no unique answer, and it is always determined by a specific situation on a market.

The analysis is conducted using data concerning market shares. The data for the analysis is shown in the following tables.

Insert table 1 about here

Insert table 2 about here

Insert Figure 1 about here

Trends in HHI in the German TV market can be analysed through Figure 1. HHI by channel started at 0.4034 in 1983 and fell down to 0.0694 in 2018. This means that the level of concentration fell from high to low. The analysis of HHI by group shows a fall from 1 in 1983 to 0.3104 in 2018, which are both in the area of high concentration. The next step in the analysis is the examination of the shares of three leading groups and channels.

Insert Figure 2 about here

Figure 2 shows the analysis of the TV market concentration in Germany using the three largest players in the market. The analysis by channel shows a fall in the concentration ratio C3 from 100% in 1983 to 38.1% in 2018, while the analysis by group shows a fall from 100%

in 1983 to 87.5% in 2018. Despite the enormous fall in the level of concentration on the level of channel, it still remains high on the group level.

Both of these indicators, HHI and concentration ratio C3, lead to conclusions concerning the trends in concentrations of the German TV market over the last 36 years. Analysis by channel shows a significant fall in market concentration. This is due to the very high number of channels operating in the marketplace. On the other hand, the level of concentration analysed by the group of channels also shows a decrease, but this decrease is much milder. This means that, despite the rising number of TV channels, the majority are controlled by three major groups (Public TV, RTL, ProSiebenSat.1).

Insert Figure 3 about here

Figure 3 shows the values of HHI for the Croatian TV market. The value of HHI by channel fell from 0.3708 in 2002 to 0.1112 in 2018 - from an area of high concentration to an area of moderate concentration. The analysis by group shows a fall in HHI from 0.7690 in 2002 to 0.2146 in 2018. Both of these values are characteristic of a highly concentrated market, but there is an obvious trend in the progressive decrease in concentration.

Insert Figure 4 about here

Figure 4 shows the values of concentration ratio C3. In terms of channels, C3 decreased from 87.0% in 2002 to 51.4% in 2018. C3 at a group level also decreased from 98.0% in 2002 to 79.4% in 2018. As with the German market, a significant decrease in the level of concentration by channel can be seen, but this is a much lower decrease when analysed by group.

HHI and C3 for the Croatian TV market show trends over the last 17 years. There is an obvious fall in market concentration measured by all indicators. The number of channels is rising, which diminishes the concentration. On the other hand, the majority of new channels are owned by one of three leading groups, which stops the level of concentration of the group from falling significantly. The Croatian TV market is currently an oligopolistic market, with three main players holding 80% of the market.

7. Comparison of German and Croatian TV market

The first TV channel in Germany started in 1954 and, only two years later, in 1956, Croatia got its first TV channel. The other main comparisons are shown in Table 3.

Insert table 3 around here

Besides the difference of only two years in the start of each country's first TV channel, there are only five years difference in the start of each country's first private TV channel. Here, it is important to note that, at the time, Germany was a liberal free-market economy, while Croatia was a regulated communist economy. Despite the start of the liberalization of the TV market in 1989, the Croatian TV market obtained its first real competitor at a national level in 2000. In both countries entry barriers are today significantly lower compared to the period from 30 years ago. Despite a high degree of the market liberalization, todays' entry barriers emerge from the position and power of existing TV stations of which many are recognized as a traditional brand.

In both countries, there is a significant fall in concentration measured in terms of the level of channel. The current situation shows that Germany has a lower concentration than Croatia, measured by HHI (0.0694<0.1112) and C3 (31.8%<51.4%). On the other hand, the level of concentration measured for groups is lower in Croatia than in Germany for both HHI (0.2146<0.3104) and C3 (79.4%<87.5%). This means that Germany has more TV channels and that the share between them is better distributed but, at the same time, the majority of these channels are owned by one of three leading groups.

In both the German and Croatian TV markets, there are three main groups operating. In Germany, these are Public TV Group, RTL Group, and ProSiebenSat.1 Group, while in Croatia they are Public TV Group, RTL Group, and Nova Group. RTL Group is present in both markets and, in each of them, it has around the same proportional share or approximately 21%.

Using market shares, this paper has calculated the indicators of market concentration. The next step in this analysis is the development of a regression model for trend analysis. The principal idea of this analysis is to estimate the trend model for each of the concentration indicators, which will allow for the calculation of the predicted values for future years.

For each set of data (HHI by channel, HHI by group, C3 by channel, C3 by group – all for both Germany and Croatia), this paper tests various econometric models. These are:

1. Linear trend

$$y_t = a + b \cdot x_t$$

2. Exponential trend

$$y_t = a \cdot e^{bx_t}$$

3. Logarithmic trend

$$y_t = a + b \cdot \ln(x_t)$$

4. Power trend

$$y_t = a \cdot {x_t}^b$$

5. Polynomial 2nd order

$$y_t = a \cdot x_t^2 + b \cdot x_t + c$$

Based on the results of these models, this research finds the model which best fits each concentration indicator trend. The criteria for the selection process were coefficients R-Square. It is also important to mention here that the number of years differ – 17 for Croatia

and 36 for Germany. Out of 40 tested models, 8 have been chosen and are analysed here. The models obtained in this way have served as the basis from which to calculate future predicted values for measures of concentration. This analysis will show the direction in which the German and Croatian TV markets can be expected to develop in next five years, and how market concentrations should change according to the developed trend.

Market concentration in this paper has been calculated using different measures of concentration (Herfindahl-Hirschman index and concentration ratio C3). Concentration ratio shows the market share of R biggest TV channels. In this paper, the concentration ratio has been calculated and analysed for the 3 biggest channels. Although concentration ratio is easy to calculate and understand, its main disadvantage is that it does not include all of the channels on the market. Because of this, concentration ratio is often combined with the HHI of concentration. The HHI of concentration is the measure calculated using data pertaining to the market shares of all TV channels on the market. All regression trend models in this paper have been developed for both concentration ratios and the HHI of concentration.

The emergence of new competitors lowers the rate of market concentration. As there has been an increase in newcomers in the marketplace, the level of market concentration has been getting during the analysed period. As a counter-attack, existing competitors try to increase their share and obtain more market power. These two forces are competing and both are crucial for market concentration.

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From Tables 4-7, we can analyse the predicted values for the period between 2019 and 2023. According to the developed models, the level of concentration and market power in the German TV market should slightly decrease. The same trend is present in all four analysed variables: HHI by channel, HHI by group, C3 by channel, and C3 by group. In the same period, the models estimate that the level of market concentration for the Croatian TV

market should also decrease in terms of all indicators with the exception of C3 by group, which should slightly increase.

Predicted levels of concentration show that, from 2019 to 2023, the concentration in Germany and Croatia measured by HHI by channel should remain low. In the same period, the level of concentration measured by HHI by group should remain high in Germany and it should lower itself from high to moderate in Croatia.

8. Conclusion

This paper contributes to existing literature in this field in two different ways. Firstly, it provides a complete overview of the market shares of TV channels in Germany from 1983 to 2018 and in Croatia from 2002 to 2018, representing the first time that data of this kind has been shown as a time series in literature. Secondly, it estimates trend models, which could serve to predict the future values of concentration in the TV markets in Germany and Croatia.

In this paper authors have analysed three main research questions. The historical analysis shows the development of television markets in Germany and Croatia from monopoly of the public television towards oligopoly of several televisions and later monopolistic competition with many televisions on the market. The data used in this paper show the similarities between German and Croatian TV market in the terms of market power and market concentration – they have both been lowering after the process of deregulation and liberalization. Today the market concentration in Germany is lower than in Croatia, bit the trends in both countries are negative. The future trends in these two television markets can be analysed using the developed models. According to these models, authors expect that the level of market concentration in both countries will be lowered in next 5 years.

The analysis conducted in this paper serves as a basis for similar analyses carried out in any other European country. The research has shown that, for “old Europe” and “new Europe”, there are no great differences when it comes to the TV market. The liberalization and the fall of concentration started to occur later in Croatia than it did in Germany, but today these two markets are similar. The German TV market has a larger number of TV channels, but both markets are oligopolistic markets with three leading groups holding the vast majority of the total market share.

This paper has several important contributions. Firstly, this is the first time in scholarly literature that such an extended time frame has been considered. Secondly, based on the data about market shares, this paper conducts an analysis of the market concentration for Germany and Croatia. Thirdly, authors have tested different trend models and have chosen the best ones for predicting future levels of market concentration. Fourthly, authors have shown that the way of liberalization of TV market in Germany and Croatia is similar, the only difference is the time when it started and the phase in which it currently is. Fifthly, authors have predicted that in both Germany and Croatia the level of market concentration should

be lowering in next 5 years, measured by both concentration ratio C3 and Herfindahl-Hirschmann index HHI.

This paper is limited by the fact that sufficient data for TV stations with small shares (local, satellite, and cable TV channels) does not exist. This information could give better overview of distribution of shares between other participants outside of the three leading groups.

For future research, this analysis could be extended to other European countries, but also to some non-European countries, which have similar developmental trends in their respective TV markets. Additionally, it would be useful to conduct a follow-up analysis of the next 10 years to see how the German and Croatian TV markets continue to develop.

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Table 1: German TV market shares from 1983 to 2018.

Launched	*Channel*	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1954	Das Erste	41,0%	45,0%	43,4%	44,9%	42,2%	37,9%	31,7%	30,8%	27,5%	22,0%	17,0%	16,3%	14,6%	14,8%	14,7%	15,4%	14,2%	14,3%
1963	ZDF	47,0%	44,0%	42,6%	40,2%	40,7%	36,2%	32,4%	28,8%	25,6%	22,0%	18,0%	17,0%	14,7%	14,4%	13,4%	13,6%	13,2%	13,3%
1960's	ARD-Dritte	12,0%	11,0%	10,2%	10,1%	10,5%	10,7%	10,4%	9,0%	8,8%	8,3%	7,9%	8,9%	9,7%	10,1%	11,6%	12,3%	12,5%	12,7%
2009	ZDF neo																		
1997	ZDF info																		
2011	ZDF kultur																		
1984	3 sat											0,8%	1,0%	0,9%	0,9%	0,9%	0,9%	0,9%	0,9%
1997	Phoenix																0,3%	0,4%	0,4%
1997	Kika															0,6%	0,9%	1,3%	1,2%
1992	Arte											0,1%	0,2%	0,2%	0,3%	0,3%	0,3%	0,3%	0,3%
1997	One (ex EinsFestival)																		
1997	Tagesschau 24 (ex EinsExtra)																		
	PUBLIC TV	***100%***	***100%***	***96,2%***	***95,2%***	***93,4%***	***84,8%***	***74,5%***	***68,6%***	***61,9%***	***52,3%***	***43,8%***	***43,4%***	***40,1%***	***40,5%***	***41,5%***	***43,7%***	***42,8%***	***43,1%***
1984	RTL			0,4%	0,7%	1,2%	4,1%	10,0%	11,5%	14,4%	16,7%	18,9%	17,5%	17,6%	17,0%	16,1%	15,1%	14,8%	14,3%
1993	RTL II											2,6%	3,9%	4,6%	4,5%	4,0%	3,8%	4,0%	4,8%
1995	Super RTL														2,1%	2,3%	2,9%	2,8%	2,8%
1993	VOX											1,3%	2,0%	2,6%	3,0%	3,0%	2,8%	2,8%	2,8%
2012	RTL Nitro																		
2016	RTL plus																		
1992	n-tv													0,3%	0,3%	0,5%	0,6%	0,7%	0,7%
	RTL GROUP	***0,0%***	***0,0%***	***0,4%***	***0,7%***	***1,2%***	***4,1%***	***10,0%***	***11,5%***	***14,4%***	***16,7%***	***22,8%***	***23,4%***	***25,1%***	***26,9%***	***25,9%***	***25,2%***	***25,1%***	***25,4%***
1984	Sat 1					1,5%	5,8%	8,5%	9,0%	10,6%	13,1%	14,4%	14,9%	14,7%	13,2%	12,8%	11,8%	10,8%	10,2%
2013	Sat 1 Gold																		
1989	Pro Sieben								1,3%	3,8%	6,5%	9,2%	9,4%	9,9%	9,5%	9,4%	8,7%	8,4%	8,2%
2013	Pro Sieben Maxx																		
1992	Kabel eins											1,6%	2,0%	3,0%	3,6%	3,8%	4,4%	5,4%	5,5%
2016	Kabel eins Doku																		
2010	Sixx																		
	PROSIEBENSAT1 GRUOP	***0,0%***	***0,0%***	***0,0%***	***0,0%***	***1,5%***	***5,8%***	***8,5%***	***10,3%***	***14,4%***	***19,6%***	***25,2%***	***26,3%***	***27,6%***	***26,3%***	***26,0%***	***24,9%***	***24,6%***	***23,9%***
2000	Welt/N24																		
1988	Sport 1 (ex DSF)								0,6%	1,9%	3,0%	1,3%	1,2%	1,3%	1,1%	1,2%	1,1%	1,3%	1,2%
1989	Eurosport												1,2%	1,2%	1,2%	1,1%	1,1%	1,1%	1,0%
	Sky-Sender (37 channels)																		
2005	Nickelodeon																		
2002	Tele 5																		
2001	Dmax																		
2005	Disney Channel (ex Das Vierte)																		
1995	Comedy central (ex Viva Plus)																		
1993	Viva																		
2014	TLC																		
	Others	0,0%	0,0%	3,4%	4,1%	3,9%	5,3%	7,0%	9,0%	7,4%	8,4%	6,9%	4,5%	4,7%	4,0%	4,3%	4,0%	5,1%	5,4%

Launched	*Channel*	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1954	Das Erste	13,7%	14,2%	14,0%	13,9%	15,5%	14,2%	13,4%	13,4%	12,7%	13,2%	12,4%	12,3%	12,1%	12,5%	11,6%	12,1%	11,3%	11,5%
1963	ZDF	13,0%	13,8%	13,2%	13,6%	13,5%	13,6%	12,9%	13,1%	12,5%	12,7%	12,1%	12,6%	12,8%	13,3%	12,5%	13,0%	13,0%	13,9%
1960's	ARD-Dritte	13,0%	13,1%	13,4%	13,7%	13,6%	13,5%	13,5%	13,2%	13,5%	13,0%	12,5%	12,6%	13,0%	12,4%	12,5%	12,1%	12,8%	12,7%
2009	ZDF neo											0,4%	0,6%	1,0%	1,3%	1,6%	2,1%	2,9%	3,2%
1997	ZDF info											0,1%	0,4%	0,7%	0,9%	1,0%	1,2%	1,2%	1,4%
2011	ZDF kultur												0,1%	0,2%	0,3%	0,4%	0,2%		
1984	3 sat	0,9%	0,9%	1,0%	1,0%	1,0%	1,0%	1,0%	1,1%	1,1%	1,0%	1,0%	1,0%	1,1%	1,1%	1,1%	1,2%	1,3%	1,3%
1997	Phoenix	0,5%	0,5%	0,5%	0,5%	0,6%	0,7%	0,9%	0,9%	1,0%	1,0%	1,1%	1,1%	1,1%	1,1%	1,1%	1,1%	1,1%	1,0%
1997	Kika	1,2%	1,1%	1,2%	1,2%	1,2%	1,1%	1,2%	1,3%	1,4%	1,4%	1,3%	1,4%	1,2%	1,2%	1,1%	1,1%	1,1%	0,9%
1992	Arte	0,4%	0,4%	0,3%	0,4%	0,5%	0,5%	0,7%	0,6%	0,7%	0,8%	0,8%	0,8%	0,9%	1,0%	1,0%	1,0%	1,1%	1,1%
1997	One (ex EinsFestival)																	0,6%	0,8%
1997	Tagesschau 24 (ex EinsExtra)																	0,3%	0,3%
	PUBLIC TV	***42,7%***	***44,0%***	***43,6%***	***44,3%***	***45,9%***	***44,6%***	***43,6%***	***43,6%***	***42,9%***	***43,1%***	***41,7%***	***42,9%***	***44,1%***	***45,1%***	***43,9%***	***45,1%***	***46,7%***	***48,1%***
1984	RTL	14,8%	14,6%	14,9%	13,8%	13,2%	12,8%	12,4%	11,7%	12,5%	13,6%	14,1%	12,3%	11,3%	10,3%	9,9%	9,7%	9,2%	8,3%
1993	RTL II	4,0%	3,9%	4,7%	4,9%	4,2%	3,8%	3,9%	3,8%	3,9%	3,8%	3,6%	4,0%	4,2%	3,9%	3,7%	3,5%	3,2%	3,0%
1995	Super RTL	2,8%	2,4%	2,7%	2,7%	2,8%	2,6%	2,5%	2,4%	2,5%	2,2%	2,2%	2,1%	1,9%	1,7%	1,8%	1,8%	1,6%	1,5%
1993	VOX	3,1%	3,3%	3,5%	3,7%	4,2%	4,2%	5,6%	5,4%	5,4%	5,6%	5,6%	5,8%	5,6%	5,2%	5,1%	5,2%	5,1%	4,8%
2012	RTL Nitro												0,3%	0,7%	1,3%	1,4%	1,3%	1,6%	1,7%
2016	RTL plus																0,4%	1,1%	1,3%
1992	n-tv	0,7%	0,6%	0,6%	0,5%	0,6%	0,6%	0,6%	0,8%	0,9%	0,9%	1,0%	0,9%	0,9%	1,0%	1,0%	1,1%	1,1%	1,0%
	RTL GROUP	***25,4%***	***24,8%***	***26,4%***	***25,6%***	***25,0%***	***24,0%***	***25,0%***	***24,1%***	***25,2%***	***26,1%***	***26,5%***	***25,4%***	***24,6%***	***23,4%***	***22,9%***	***23,0%***	***22,9%***	***21,6%***
1984	Sat 1	10,1%	9,9%	10,2%	10,3%	10,1%	9,8%	9,6%	10,3%	10,4%	10,1%	10,1%	9,4%	8,2%	8,1%	7,9%	7,3%	6,7%	6,2%
2013	Sat 1 Gold													0,3%	0,7%	1,4%	1,4%	1,5%	1,6%
1989	Pro Sieben	8,0%	7,1%	7,1%	7,0%	6,7%	6,6%	6,6%	6,6%	6,6%	6,3%	6,2%	5,9%	5,7%	5,5%	5,3%	5,0%	4,5%	4,4%
2013	Pro Sieben Maxx													0,1%	0,5%	0,7%	0,6%	0,7%	0,8%
1992	Kabel eins	5,0%	4,5%	4,2%	4,0%	3,8%	3,6%	3,6%	3,6%	3,9%	3,9%	4,0%	3,9%	4,0%	3,8%	3,8%	3,8%	3,4%	3,5%
2016	Kabel eins Doku																0,0%	0,3%	0,5%
2010	Sixx											0,3%	0,6%	0,6%	0,7%	0,8%	0,8%	0,7%	0,8%
	PROSIEBENSAT1 GRUOP	***23,1%***	***21,5%***	***21,5%***	***21,3%***	***20,6%***	***20,0%***	***19,8%***	***20,5%***	***20,9%***	***20,3%***	***20,6%***	***19,8%***	***18,9%***	***19,3%***	***19,9%***	***18,9%***	***17,8%***	***17,8%***
2000	Welt/N24			0,4%	0,4%	0,6%	0,8%	0,9%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,1%	1,2%	1,1%	0,9%
1988	Sport 1 (ex DSF)	1,0%	0,9%	1,1%	1,1%	1,2%	1,0%	1,1%	0,9%	0,9%	0,8%	0,9%	0,7%	0,9%	0,8%	0,9%	0,9%	0,9%	0,7%
1989	Eurosport	0,9%	0,8%	0,9%	0,9%	0,9%	0,9%	1,0%	0,9%	0,9%	0,7%	0,7%	0,7%	0,7%	0,6%	0,7%	0,6%	0,6%	0,5%
	Sky-Sender (37 channels)											1,0%	1,2%	1,4%	1,2%	1,4%	1,2%	1,5%	1,5%
2005	Nickelodeon								0,8%	0,9%	0,8%	0,8%	0,7%	0,7%	0,6%	0,8%	0,7%	0,6%	0,5%
2002	Tele 5				0,3%	0,4%	0,6%	0,7%	0,9%	1,0%	0,9%	1,0%	1,0%	0,9%	0,9%	0,9%	0,9%	0,8%	0,9%
2001	Dmax		0,0%	0,1%	0,1%	0,2%	0,3%	0,5%	0,6%	0,7%	0,7%	0,7%	0,7%	0,9%	1,0%	1,0%	1,0%	1,0%	1,0%
2005	Disney Channel (ex Das Vierte)						0,6%	0,8%	0,8%	0,6%	0,2%	0,2%			0,8%	0,8%	0,9%	0,9%	0,9%
1995	Comedy central (ex Viva Plus)				0,2%	0,3%	0,3%				0,3%	0,4%	0,3%	0,3%	0,3%	0,4%	0,3%	0,4%	0,4%
1993	Viva				0,4%	0,5%	0,6%	0,6%			0,5%	0,5%	0,5%	0,4%	0,3%	0,2%	0,1%	0,1%	
2014	TLC															0,2%	0,3%	0,3%	0,4%
	Others	6,9%	8,0%	6,0%	5,4%	4,4%	6,3%	6,0%	5,9%	5,0%	4,6%	4,0%	5,1%	5,2%	4,7%	4,9%	4,9%	4,4%	4,8%

Table 2: Croatian TV market shares from 2002 to 2018.

Launched	*Channel*	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1956	HTV1	55,0%	42,8%	39,1%	38,2%	34,6%	33,2%	32,6%	31,5%	26,9%	21,2%	19,6%	16,8%	16,0%	15,1%	15,4%	15,1%	14,8%
1966	HTV2	21,0%	18,9%	17,8%	15,8%	17,7%	16,1%	14,0%	12,3%	11,3%	8,9%	9,4%	7,9%	8,3%	7,1%	8,1%	6,6%	8,0%
2012	HTV3	11,0%	12,5%									1,1%	1,4%	1,7%	2,4%	2,0%	2,0%	2,0%
2012	HTV4													2,5%	4,4%	3,7%	3,3%	2,8%
	HRT GROUP	***87,0%***	***74,2%***	***56,9%***	***54,0%***	***52,4%***	***49,2%***	***46,6%***	***43,8%***	***38,2%***	***30,1%***	***30,1%***	***26,1%***	***28,4%***	***28,9%***	***29,1%***	***27,1%***	***27,6%***
2000	NovaTV	11,0%	15,6%	14,3%	13,5%	15,1%	17,6%	19,5%	20,6%	23,2%	23,6%	24,6%	25,0%	23,0%	23,5%	22,9%	24,1%	24,0%
2011	Doma TV										4,1%	4,9%	5,0%	5,3%	4,7%	5,4%	5,6%	6,6%
	NOVA GROUP	***11,0%***	***15,6%***	***14,3%***	***13,5%***	***15,1%***	***17,6%***	***19,5%***	***20,6%***	***23,2%***	***27,7%***	***29,5%***	***29,9%***	***28,3%***	***28,2%***	***28,3%***	***29,7%***	***30,5%***
2004	RTL			25,8%	24,8%	24,6%	23,8%	22,9%	22,2%	21,4%	17,4%	16,7%	15,8%	14,0%	14,2%	13,2%	14,1%	12,7%
2011	RTL 2										4,1%	3,9%	4,0%	4,0%	4,6%	5,3%	5,0%	5,2%
2013	RTL Kockica													2,8%	3,2%	3,4%	3,7%	3,4%
	RTL GROUP			***25,8%***	***24,8%***	***24,6%***	***23,8%***	***22,9%***	***22,2%***	***21,4%***	***21,6%***	***20,7%***	***19,8%***	***20,8%***	***22,0%***	***21,9%***	***22,9%***	***21,2%***
2011	SPTV										0,4%	0,4%	0,5%	0,3%	0,5%	0,5%		0,3%
2011	CMC										2,0%	1,7%	1,7%	1,6%	1,5%	1,4%	1,4%	1,1%
	Others	2,0%	10,2%	3,1%	7,8%	8,0%	9,4%	11,0%	13,5%	17,3%	18,3%	17,7%	22,0%	14,6%	16,5%	15,4%	19,0%	19,2%

Source: Authors from different sources

Table 3: Comparison of German and Croatian TV market.

	Germany	***Croatia***
Start of the first TV channel	1954	1956
Start of the first private TV	1984	1989
Number of leading TV groups	3	3
HHI in 2018 (by channel)	0.0694	0.1112
HHI in 2018 (by group)	0.3104	0.2146
C3 in 2018 (by channel)	31.8%	51.4%
C3 in 2018 (by group)	87.5%	79.4%

Table 4: Chosen regression models for estimating future values – Germany.

Concentration indicator	***Selected model***	***Coefficient of determination***
HHI by channel	$y_t = 0.6626 \cdot {x_t}^{-0,622}$	$R^2 = 0.9299$
HHI by group	$y_t = 1.2377 \cdot {x_t}^{-0,447}$	$R^2 = 0.8382$
C3 by channel	$y_t = 1.3630 \cdot {x_t}^{-0,375}$	$R^2 = 0.9128$
C3 by group	$y_t = 1.009 - 0.036 \cdot ln(x_t)$	$R^2 = 0.8036$

Source: authors

Table 5: Predicted values of market concentration based on calculated regression coefficients for Germany for the period 2019 – 2023.

	Year				
Concentration indicator	**2019**	**2020**	**2021**	**2022**	**2023**
HHI by channel	0.0701	0.0690	0.0679	0.0668	0.0658
HHI by group	0.2464	0.2435	0.2407	0.2380	0.2353
C3 by channel	35,19%	34,84%	34,50%	34,18%	33,86%
C3 by group	87,90%	87,80%	87,71%	87,62%	87,53%

Source: authors

Table 6: Chosen regression models for estimating future values – Croatia.

Concentration indicator	***Selected model***	***Coefficient of determination***
HHI by channel	$y_t = 0.3432 \cdot e^{-0.076x_t}$	$R^2 = 0.9403$
HHI by group	$y_t = 0.7558 \cdot {x_t}^{-0,489}$	$R^2 = 0.9637$
C3 by channel	$y_t = 0.8818 - 0.0235 \cdot x_t$	$R^2 = 0.9341$
C3 by group	$y_t = 0.0007 \cdot x_t^2 - 0.0261 \cdot x_t + 1{,}0087$	$R^2 = 0.8648$

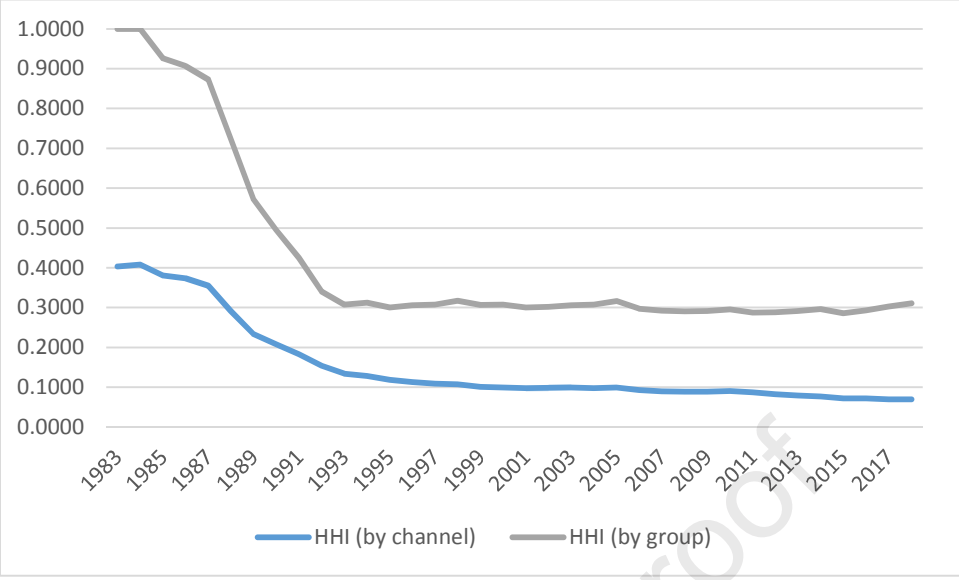
Source: authors

Table 7: Predicted values of market concentration based on calculated regression coefficients for Croatia for the period 2019 – 2023.

	Year				
Concentration indicator	**2019**	**2020**	**2021**	**2022**	**2023**
HHI by channel	0.0874	0.0810	0.0751	0.0696	0.0645
HHI by group	0.1839	0.1791	0.1747	0.1705	0.1667
C3 by channel	45,88%	43,53%	41,18%	38,83%	36,48%
C3 by group	76,57%	76,55%	76,67%	76,93%	77,33%

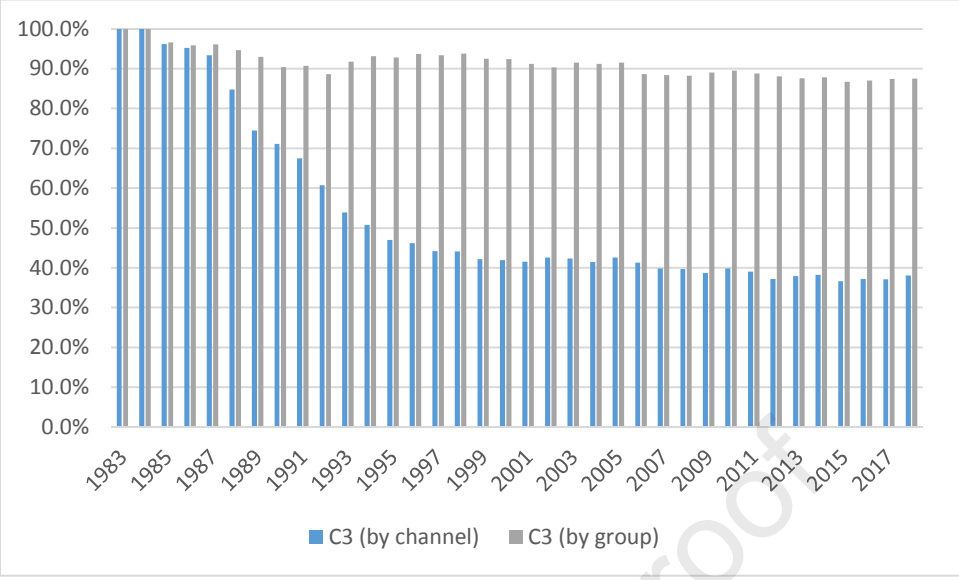
Source: author's calculation

Figure 1: Herfindahl-Hirschman Index for German TV market 1983-2018.



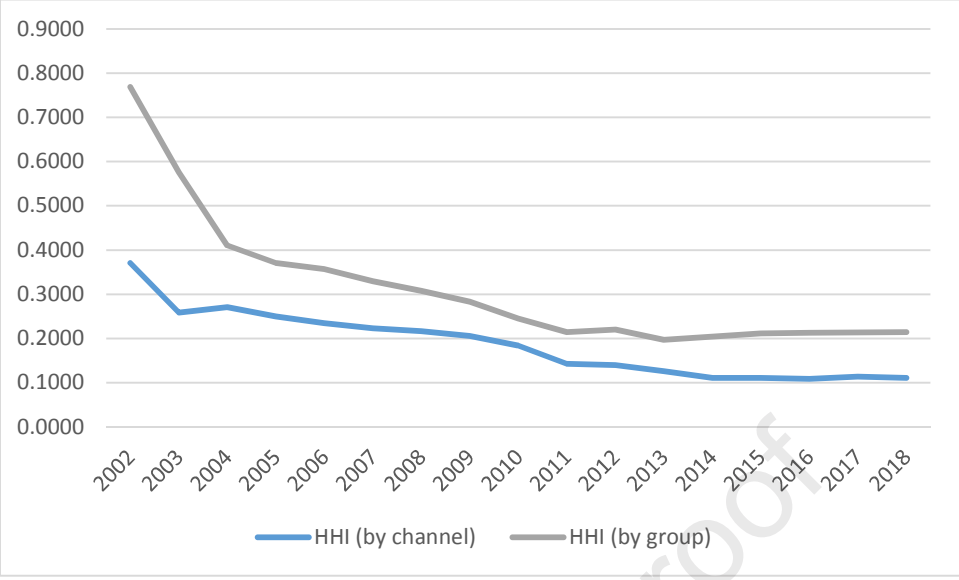
Source: authors' calculation

Figure 2: Concentration ratio C3 for German TV market 1983-2018.



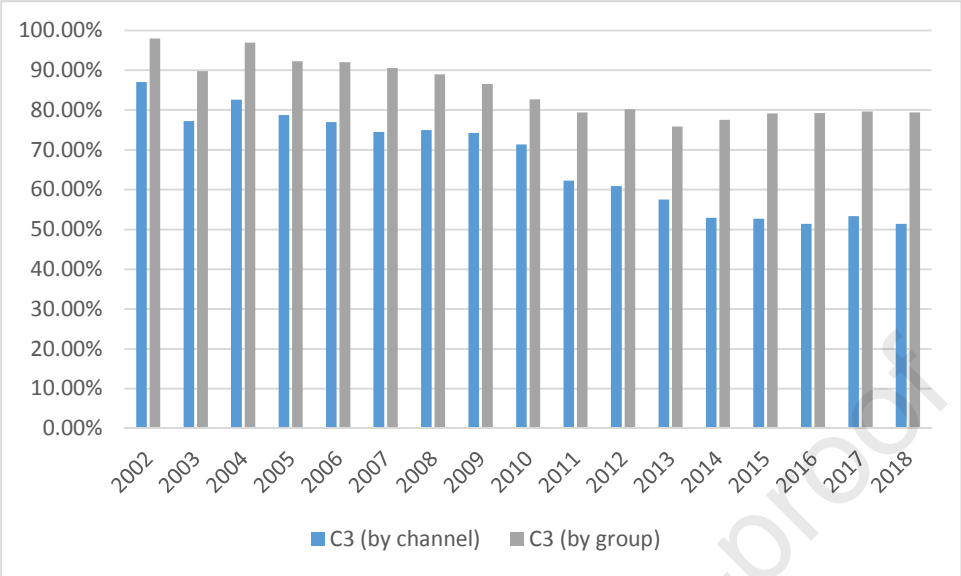
Source: authors' calculation

Figure 3: Herfindahl-Hirschman Index for Croatian TV market 2002-2018.



Source: authors' calculation

Figure 4: Concentration ratio C3 for the Croatian TV market 2002-2018.



Source: authors' calculation

Highlights

- Croatian TV market is similar to the German one, but with a time-lag

- Television market in Croatia is between oligopoly and monopolistic competition

- TV market in Germany is monopolistic competition with high number of channels

- German and Croatian TV markets are both dominated by three main groups

- Concentration levels on TV markets in Germany and Croatia are falling

Dear Editor,

We are delighted to submit our research entitled Models of Television Market Power in Germany and Croatia

We confirm that this article has not been published or is under consideration in another journal outlet, and that we will not submit this article to another journal.

We appreciate your guidance at this stage of the process, and we look forward to hearing from you.

Thank you for considering our manuscript for publication in the Technology in Society.

In behalf of authors

Most sincerely

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