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Media control: A case for privatization in transitional economies

Abstract

The television market can be one of the most dynamic industries if country-specific regulations allow for private competitors to enter the market. The entry of competition changes the market from monopolistic to oligopolistic which has positive performance implications for the industry. Our research ~~which focuses on market concentration,~~ analyses the development of the Croatian TV market from the monopolistic stage to the current oligopolistic stage. Econometric models in this paper aim to estimate the current trend of market concentration and its future potential. ~~Our findings are unique for the researcher as we~~Our researched focusinging on the industry from a market concentration perspective, ~~and~~ provides guidance for the practitioner in regard to profitable investment opportunities. We also illustrate for other transitional economies that to move toward a “free” society, media must be free from government control which will evolve rapidly once privatized.

Key words: market concentration, Croatia, EU, transition, television, liberalization

1. Introduction

Similar to ~~the~~ other television markets in the world, the Croatian TV market developed from a monopolistic market where the state-owned television was the one and only broadcaster for TV programmes (Leonidas et al.2014). In the 1980s, European TV markets started the process of liberalization in which many new private TV channels emerged. Since then the role of public broadcasting channels has been reduced, a large number of private channels have been introduced, and the concentration of channel ownership has first declined and then increased (Dahlgren, 2000; Iosifides, 1999). The process of liberalization of the television market in Croatia started in 1989, when the first commercial TV station, OTV, started to broadcast to a small local market. The real effects of liberalization on the national level occurred 11 years later when the first private TV station with a national concession started broadcasting.

The majority of the revenue for the TV market comes from advertising. As such, the main motive for entering any TV market is always based on the possible profit that could be made from advertising. TV channels with the largest share of ~~fr~~ the market can sell advertising time for the highest amount of money. An analysis of the market is important to determine who the key players in the market are, as they will command the largest share of the industry revenue. The importance of our research is illustrated by the amount of spending on television advertising. Television advertising reached \$186 billion in 2013 and is expected to grow at an annual rate of over 6% per year globally. Some examples of the magnitude is spending in the USA averages about \$48 billion and in Germany 4 billion euros (McKinsey, 2013). Croatia is the youngest member of the European Union, but it has historically always been part of Europe, and accordingly the Croatian TV market is similar to the evolution of the EU TV markets. **This means that this analysis can also be applied to other countries.**

Our research first investigates the process of the development of the TV market at the national level utilizing the Croatian market. The analysis includes TV channels that broadcast with a nationwide concession covering the majority of the population. The basis for the analysis is the market share for each TV channel at the national level, which is recalculated from the market shares obtained by using the SHR method in the way that all nationwide channels form one unique TV market. Values obtained in this way serve to calculate the certain measures of concentration, which will show the level of market concentration. This is very important for further development of the market, especially for possible new entries on the market. But the level of concentration is also the key factor for mergers and acquisitions on the market, because the Competition agency will not allow the rise of concentration above some higher level based on mergers and acquisitions (M&A). According to the analysis for 2008, Croatia has, together with countries like Italy and Finland ($HHI > 1800$), high concentration on the television market, while on the other side are countries like Turkey and Romania ($HHI < 1000$) with low concentration on the television market (Berg, 2014).

We then provide direction for practitioners through trend analysis for each of the national TV channels and calculate the predicted values of market share for next three years. The values obtained in this way will serve as the basis for calculating the future predicted values of measures of concentration. This will show the direction of the Croatian TV market at the national level for the next few years. The level of concentration has been falling with the entry of new channels on the market. But at the same time there were changes in the leading channel. Due to the constant growth of the market share of the current leading TV channel, it is expected that after years of falling, the level of concentration will start to grow again.

Finally, our contributions contribute to a societal level. For a society to be “free” the media must be free from government control. When the Croatian television market was privatized, newcomers quickly took market share from the government firms. As of recent

(2015), the government controlled television channels are no longer dominant in number of viewers. Even more importantly were the global/foreign firms that entered the Croatian market, as the top firm is foreign. These firms offer a global perspective and are not influenced by the government and offer programming that will deliver an eclectic view. Transitional governments that are seeking transparency in reporting, unbiased (to an extent that exists) reporting, and programmes chosen only for their success measured by the number of viewers, should take note of the privatization outcomes illustrated in our research.

2. Literature review

There are very few scientific papers that analyse the television market from an industry unit of analysis, in particular from the methodology approach utilizing market concentration (Van Der Wurff, 2005; Johannes, 2010; Berg, 2010). There is research that analyses market concentration in other markets, research that focuses on television markets, but not in regard to both television market and market concentration (Vázquez-Maguirrea and Hartmann, 2013; Schmid and Ulrich, 2013; George, 2007; Chong-En, Jie, Qiong, 2014).

Chart 1: Literature overview

Author(s)	Industry / field	Journal name	Key issues and main findings
Chen (2002)	Television	<i>The Journal of Media Economics</i>	Taiwan's cable systems and channels are highly concentrated (CR4 = 74.3%) in the hands of a few media conglomerates, meaning that the cable industry has become more oligopolistic; mergers and acquisitions among Taiwan's cable systems have dramatically changed the operation and ownership of the cable industry
Van Der Wurff (2005)	Television	<i>Journal of Cultural Economics</i>	Focuses on free, national generalist channels and tests hypotheses with data on Finland, France, Germany, Greece, Italy, the Netherlands, Spain and the U.K. for the late 1980s and 1990s; the conclusion is that competition is moderate in most markets; one important and consistent finding is that increases in channel numbers result in lower levels of channel reflective diversity and higher levels of channel distinctiveness
Johannes (2010)	Television	<i>The Business Review Cambridge</i>	Market concentration of the cable television industry in the USA from 1996 to 2008 has increased significantly measured by CR4, CR8 and HHI; the industry was a moderately concentrated oligopoly, but merger and acquisition activity started to increase the concentration and the market became highly concentrated oligopoly

Gutiérrez Rentería (2007)	Television	<i>International Journal on Media Management</i>	Analyzes multimedia industry concentration in Mexico; this paper explores the principal strategies used by TV Azteca to overcome the entry barriers set by the Televisa monopoly and presents an economic valuation of this duopoly market structure; the study assumes the hypothesis that for a new participant to overcome entry barriers established by a monopoly, its directors must develop both vertical and horizontal strategies, as well as strategies focused on content innovation
Vázquez-Maguirrea and Hartmann (2013)	Television	<i>Journal of Business Research</i>	Analyzes the nonmarket strategies of the Mexican television duopoly in order to reach an understanding of how firms gain and maintain first-mover advantages by influencing policymakers; clear evidence shows that the incumbent duopoly has used its nonmarket strategies to accrue wealth and prevent new competitors from entering the Mexican television industry
Löbbecke and Falkenberg (2002)	Television	<i>International Journal on Media Management</i>	Investigates the influence of the advent of the Internet on TV distribution channels; entry barriers to TV markets are being lowered via the Internet in various forms; potential above average profits due to the market's oligopolistic structure, as well as an increased contestability thanks to lower market entry barriers, seem to render the German TV market attractive for new entrants; the analysis suggests that once technical and legal constraints have been overcome, the Internet could be an attractive additional distribution channel for some types of television content
Rennhoff and Wilbur (2012)	Television	<i>Information Economics and Policy</i>	The study investigates how local media cross-ownership, co-ownership and ownership diversity are associated with media market outcomes; results have shown that television station ownership consolidation is associated with increased local TV news production but lower news ratings; panel estimation finds that changes in local media ownership are uncorrelated with local media usage or programming, producing confidence intervals that are tightly centered around zero
Berg (2010)	Television	<i>Public Service Media after the Recession</i>	Investigates the market concentration for television markets in the 33 sample markets; results show that these markets continue to be under conditions of oligopoly ranging from moderately to highly concentrated; the relationship between size and market concentration is questioned using a market intervention approach; the results show that market intervention alters the rules of the game, and that based on this analysis the impact of size on market concentration might be a myth
Rotundo and D'Arcangelis (2014)	Television	<i>Quality & Quantity</i>	Propose an adjustment to the Herfindahl–Hirschman concentration index for explicitly considering the role of the topology of financial economic networks on market concentration; authors deepen the analysis of the network comparing network centrality measures that are a well-known method for understanding the relative relevance of network nodes
Schmid and Ulrich (2013)	Medical care, hospital	<i>Health Policy</i>	Analyze the German hospital market; findings indicate that just some years after hospital competition was intensified, more than one third of German hospitals are located in strongly concentrated markets; this approach is very interesting, but unfortunately it could be applied only for local TV stations, and not for national TV stations
Chong-En, Jie, Qiong (2014)	Chinese industry concentration	<i>China Economic Review</i>	Utilize the non-linear estimation method to simulate the Zipf distribution, and construct an alternative measure of Hirschman–Herfindahl index (HHI), in order to reveal the real changes in monopoly of China's industrial markets; based on the annual waves of the Chinese Industrial Enterprises Database between 1998 and 2009, it finds that systematic bias of deceptive declining concentration would be very easy to appear when directly using censored survey data with some invariant threshold

George (2007)	Newspaper	<i>Information Economics and Policy</i>	Examines the effect of ownership concentration on product position, product variety and circulation in the US daily newspaper market; using data at 706 newspapers in 1993, 1999 and 2004, results have shown that both differentiation and variety increase with ownership concentration
Doyle (2010)	Television and culture	<i>Journal of Cultural Economics</i>	Drawing on an analysis of recent research findings related to multi-platform strategies in the television industry, the author examines what is distinctive about economics of culture, and it assesses the appeals but also the challenges associated with conducting scholarly research work in this particular area
O'Hagan and Jennings (2003)	Public sector broadcasting	<i>Journal of Cultural Economics</i>	Paper deals with some key issues arising in the current debate in Europe over public sector broadcasting (PSB); it asks what is understood by PSB and examines critically the arguments for PSB; paper provides some statistical analysis of the extent, funding and programme mix of European PSB; it examines in some detail the issues surrounding the licence fee as an instrument for funding PSB

~~There is relatively little research -television market has been analysed by a few articles~~ utilizing concentration measures on the television market. Past research suggests that when the Taiwan cable television industry was privatized, concentration rates went from 39% to 74 % within 6 years (Chen, 2002). Other research investigated how competition, concentration and public broadcasters influence diversity of programme supply in European television markets. This research that focused on Finland, France, Germany, Greece, Italy, the Netherlands, Spain and the U.K. for the late 1980s and 1990s found that competition and concentration contribute to a diverse supply of programmes that mirrors audience demand (Van Der Wurff, 2005). Research that reviewed the changes in the market concentration of the cable television industry in the USA from 1996 to 2008 found that the industry had become a highly concentrated oligopoly (Johannes, 2010).

The Mexican television market was a monopoly until 1993 when satellite TV firm Azteca Satellite entered and quickly got 30% of the market share (Gutiérrez Rentería, 2007). The duopoly was maintained due to first mover advantages and barriers to entry (Vázquez-Maguirrea and Hartmann, 2013). Substitute products for television (such as the internet) have been explored as entry barriers have been lowered. In Germany above average profits are indicated through internet entry challenging the oligopolistic market (Löbbecke and

Falkenberg, 2002). ~~Market concentration was explored based upon the size of the television market and found that~~ Other research suggested the market size had no correlation with market concentration (Berg, 2010).

The use of market concentration analysis has been used in other industries besides that of the television market. For example, Schmid and Ulrich (2013) analysed the German hospital market. The findings indicated that shortly after hospital competition intensified, more than one third of German hospitals are now located in highly concentrated markets. Chong-En, Jie, Qiong (2014) utilized non-linear estimation to simulate the Zipf distribution and construct an alternative measure of Hirschman–Herfindahl index (HHI) in order to reveal the real changes in the monopoly of China's industrial markets. Between 1998 and 2009, China actually experienced much less competition improvement, or monopoly reduction, in many industries during this period. George (2007) examines the effect of ownership concentration on product position, product variety and circulation in the US daily newspaper market. Using data at 706 newspapers in 1993, 1999 and 2004, results have shown that both differentiation and variety increase with ownership concentration.

Various other television research suggests that culture seems to both attract and resist economic analysis (Doyle, 2010). Drawing on an analysis of recent research findings related to multi-platform strategies in the television industry, the author examines what is distinctive about the economics of culture, and it assesses the appeal but also the challenges associated with conducting scholarly research work in this particular area. O'Hagan and Jennings (2003) focus on key issues arising in the current debate in Europe over public sector broadcasting (PSB). ~~It asks what is understood by PSB~~ The research summarizes the PSB research and then ~~and examines ecritically~~ examines each of the arguments ~~for PSB~~.

~~As there is a~~ Our research attempts to fill the gap in the literature, especially regarding ~~TV markets of last 13 EU members and new EU candidates. We analyze the ,this paper tries~~

~~to present Croatian TV market in the way that it can be compared to other similar TV markets from a market concentration perspective so that it can be evaluated and generalizable. Similar analysis could be done in other countries and we expect that they would bring similar results.~~ We anticipate that similar research with other markets could provide further support for our results.

3. The development of Croatian TV market at the national level

Media ownership controlled by too few companies within a country contradicts the basic tenet of democracy as it threatens the diversity of expression and risks autocratic control of communicative spaces (Barnett, 2010). For television, as one of the media available with the strongest influence, it is especially important to have a variety of programmes, ~~which~~ reflecting a variety of opinions. ~~Because of this fact~~ Hence, the liberalization of a TV market is a very important step in each country that is moving to a democratically controlled government.

The Croatian TV market was monopolistic until the year 2000. This situation is comparable to Mexico when the only firm was Televisa. But the main difference is that Televisa is a private company, and the Croatian monopolist was government controlled. The state owned television HRT (Croatian radio-television) had three programmes, HRT 1, HRT 2 and HRT 3. The first private TV station with the national coverage, Nova TV, was launched in November 2000. It is the channel launched by the Central European Media Enterprises (CME). In 2004 Croatian government decided to privatize the frequency on which HRT 3 was broadcasted. The best bidder for taking this frequency in a 10-year concession was the German RTL Group, which launched the new TV station in April 2004.

After the process of digitalisation in Croatia was finished, several new TV stations with nationwide coverage started transmitting: RTL 2 (owned by RTL), Doma TV (owned by CME), SPTV (Sport television) and CMC (Croatian Music Channel). At the end of 2012,

HRT launched two new channels, HRT 3 and HRT 4. The first of them is a cultural channel; the second is a news channel. In 2014 RTL launched [a](#) new channel for children and family named RTL kockica.

The whole process of the development of the TV market in Croatia is similar to other countries. In Germany the liberalization of TV market started in 1984 with two private channels, RTL and SAT1. Today German TV market is one of the most developed markets in the world with a large number of TV stations on the national level with low levels of concentration. Similarly Italy, where the monopoly of RAI ended in 1980 with the private channel Canale 5, today there are numerous TV channels. Based on such examples, the Croatian TV market can expect further development with the entrance of new channels on the market.

At the writing of this paper, Croatian national TV market has 11 TV channels, which are shown in Table 1.

Table 1: Croatian TV channels with nationwide coverage

Channel	Owner	Programming	Year of launch	MUX
HRT 1	Croatian radio-television	General	1956	A
HRT 2	Croatian radio-television	General	1972	A
RTL	RTL Group	General	2004	A
Nova TV	CME	General	2000	A
HRT 3	Croatian radio-television	Cultural	2012	B
HRT 4	Croatian radio-television	News	2012	B
RTL 2	RTL Group	Entertainment	2011	B
Doma TV	CME	Entertainment	2011	B
SPTV	Croatian Olympic Committee	Sport	2011	D
CMC	Autor	Music	2011	D

RTL kockica	RTL Group	Children and family	2014	D
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Source: author's synthesis

As shown in the Table 1, there are four general TV channels which are broadcasted in the first multiplex, Mux A. Four channels are broadcasted in Mux B, and 3 specialized channels are broadcasted in Mux D. Mux A has the coverage of 98% of the population, Mux B 95% and Mux D 90% (OIV). As all three multiplexes which broadcast TV channels on the national level cover the vast majority of the population, all 11 national TV channels can be analysed equally on the national TV market.

4. Methodology

Our data has been taken from the Electronic media agency (Electronic media Agency, 2012). The analysis uses TV channels that broadcast with a nationwide concession. These channels cover the vast majority of the population of Croatia. The most important variable for the analysis is the market share for each channel at the national level. The market shares used in this paper had been recalculated based on the SHR method so that all nationwide channels form one unique TV market. This means that all market shares obtained by the SHR method (share of all viewers in the period 0-24) have been supposed to be equal to 100%, and then the market share for each TV channel has been calculated. For example if there were just two national channels, one with 30% SHR and the other with 20% SHR (other 5% are local stations and specialized satellite and cable channels), then the market shares are 60% and 40%. Values obtained in this way serve to calculate the certain measures of concentration, whose aim is to show the level of market concentration on TV market in Croatia. Market concentration is considered as the best numerical variable for measuring the market power of participants in the market (Bagdikian, 2004; Baker, 2007; Ward, 2004). Higher concentration means that there are one or fewer TV channels with high market shares. In other words this means that such TV channels are more attractive for showing commercials, which results in higher revenue.

After all market shares have been calculated, the next part of the analysis is the development of the regression model for trend analysis. The principal idea of this analysis is to estimate the trend model for each of national TV channels in Croatia and to calculate the predicted values of market share for next three years.

For each set of data (each of 11 TV channels' market share), we have done 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 $y_t = a \cdot x_t^b$

Based on the results of these models, we have estimated the model that best fits for each of the TV channels' trend. The criteria for the selection were coefficients of model quality. ~~This was a "data mining" process where we have tried a number of different specifications based upon past research and then chosen the one with the highest R-squared.~~ As there are 11 years of observations, and due to the fact that we have analyzed different theoretical models, the R-squared values are high. The models obtained in this way have served as the basis for calculating the future predicted values for measures of concentration. This analysis will show in which direction the Croatian TV market at the national level will go in next three years, and how the market concentration should change according to the developed trend.

Market concentration in this paper has been calculated using different measures of concentration (concentration ratio, Herfindahl-Hirschman index). The concentration ratio shows the market share of ~~R-the~~ biggest TV channels. In this paper concentration ratio has

been calculated and analysed for the 3 to 5 biggest channels. Although concentration ratio is easy to calculate and to understand, its main disadvantage is that it does not include all channels on the market. Because of this, concentration ratio is often combined together with Herfindahl-Hirschman index of concentration. Herfindahl-Hirschman index of concentration is the measure which is calculated using the data of market shares of all TV channels on the market. All regression trend models in this paper have been developed for both concentration ratios and Herfindahl-Hirschman index of concentration.

After the Croatian television market had become privatized, new competitors entered the market. All newcomers took a portion of the market from the already existing TV stations. This was Croatian radio television (HRT) ~~in the first phase initially~~ as ~~it was~~ the ~~former~~ market monopolist ~~on the market at that time~~. The entrance of new competitors lowers the rate of market concentration. As there are more newcomers on the market, the level of market concentration was being lowered every year. Although new competitors have lowered the market concentration of Croatian television market, there still are several TV stations with significant market share.

5. Analysis of the market

Currently there are 11 TV channels on the national TV market in Croatia. There is insufficient data for the share of RTL kockica, hence the analysis will be done using the data for 10 TV channels. The market share is represented by the SHR method that shows the percentage of all people watching television who are tuned to a specific program or station at a specified time. If there are 100 people watching TV, and 20 of them watch a specific channel, then this channel has SHR value 20%.

Table 2: The market share of Croatian TV stations (% of all TV channels)

Channel name	Year				
	2004	2005	2006	2007	2008

HTV1	39,09%	38,18%	34,61%	33,16%	32,62%
HTV2	17,79%	15,79%	17,74%	16,07%	14,00%
HTV3					
HTV4					
NovaTV	14,26%	13,48%	15,08%	17,56%	19,48%
RTL	25,76%	24,77%	24,61%	23,79%	22,88%
Doma TV					
RTL 2					
Sportska Televizija					
Croatian Music Channel					
RTL Kockica					
Share of national channels	96,90%	92,22%	92,04%	90,58%	88,98%

Channel name	Year					
	2009	2010	2011	2012	2013	2014
HTV1	31,50%	26,86%	21,19%	19,60%	16,78%	15,96%
HTV2	12,31%	11,30%	8,89%	9,35%	7,90%	8,32%
HTV3				1,12%	1,43%	1,67%
HTV4						2,48%
Nova TV	20,58%	23,17%	23,64%	24,59%	24,95%	22,99%
RTL	22,15%	21,35%	17,44%	16,74%	15,80%	13,99%
Doma TV			4,07%	4,87%	4,98%	5,30%
RTL 2			4,12%	3,92%	4,01%	4,04%
Sportska Televizija			0,44%	0,41%	0,45%	0,29%
Croatian Music Channel			1,96%	1,68%	1,69%	1,56%
RTL Kockica						2,78%
Share of national channels	86,54%	82,68%	81,75%	82,28%	77,99%	79,38%

Source: Electronic media Agency (2012) Analysis of TV market

Table 2 shows the average annual values of share for the total population for the whole day. The analysis starts from 2004 when there were 4 national TV channels. At that time HRT 1 was the market leader with 39.09% of the market. The second most-viewed national channel was RTL with 25.76%. The third channel was HRT 2 with 17.79%, and the fourth Nova TV with 14.26%. Eleven years after this, on Croatian national TV market were 11 channels. The most viewed channel in 2014 is Nova TV with 22.99%, on the second place is HRT 1 with 15.96% and third is RTL with 13.99%.

Especially interesting is to observe the last row in Table 2. It shows the total share of all national TV channels on the market. The rest of the market are local TV channels, satellite

TV channels and cable TV channels). From 2004 to 2014 the share of national TV channels on the total TV market was falling from 96.90% to 79.38%. This indicates that local, satellite and cable TV channels are gaining in popularity.

As there is a certain proportion which goes on other TV channels (satellite, cable, and local), values from Table 2 will first be transformed in the way that they give the sum of 100% and then analysis will be done with such data. The reason for this is focusing the analysis on the channels with nationwide coverage.

Table 3: The market share of Croatian TV stations (% of nationwide TV channels)

Channel name	Year				
	2004	2005	2006	2007	2008
HTV1	40,34%	41,40%	37,60%	36,61%	36,66%
HTV2	18,36%	17,12%	19,27%	17,74%	15,73%
HTV3					
HTV4					
NovaTV	14,72%	14,62%	16,38%	19,39%	21,89%
RTL	26,58%	26,86%	26,74%	26,26%	25,71%
Doma TV					
RTL 2					
Sportska Televizija					
Croatian Music Channel					
RTL Kockica					

Channel name	Year					
	2009	2010	2011	2012	2013	2014
HTV1	36,40%	32,49%	25,92%	23,82%	21,52%	20,11%
HTV2	14,22%	13,67%	10,87%	11,36%	10,13%	10,48%
HTV3				1,36%	1,83%	2,10%
HTV4						3,12%
NovaTV	23,78%	28,02%	28,92%	29,89%	31,99%	28,96%
RTL	25,60%	25,82%	21,33%	20,35%	20,26%	17,62%
Doma TV			4,98%	5,92%	6,39%	6,68%
RTL 2			5,04%	4,76%	5,14%	5,09%
Sportska Televizija			0,54%	0,50%	0,58%	0,37%
Croatian Music Channel			2,40%	2,04%	2,17%	1,97%
RTL Kockica						3,50%
Share of national TV channels	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

Source: author's calculation

The analysis of the market will be done from the aspect of market concentration. Five measures of concentration will be calculated and discussed. The first four of them are concentration ratios (C1, C2, C3, C4), and the fifth is the Herfindahl-Hirschman Index of concentration (HHI).

Concentration ratio is calculated as

$$C_r = \frac{\sum_{i=1}^r x_i}{\sum_{i=1}^n x_i}$$

where n denotes the total number of market participants, r the number of largest participants for which concentration is being calculated and x_i the individual value of market share. The value of C_r can vary from 0 to 100%, where higher value shows higher concentration level. Concentration ratios show the market share of largest TV channels. C1 shows the market share of the largest TV channel, C2 market share of 2 largest TV channels, C3 is the market share of 3 leading TV channels, and C4 market share of first 4 TV channels.

Herfindahl-Hirschman Index of concentration is calculated as

$$HHI = \sum_{i=1}^n p_i^2$$

where p_i denotes the share of each individual market participant and n the total number of market participants. The value of HHI can vary from 1/10000 to 10000. Lower values of HHI indicate higher level of market competition and vice versa (Griffiths and Wall, 1996). The values of HHI lower than 1000 show low concentration, the values between 1000 and 1800 characterize moderate concentration, and the value of HHI greater than 1800 indicates high concentration (Hüschelrath, 2008; Stone, 2010; Tipurić, Pejić Bach, Pavić, 2008).

The values of concentration ratios for three and five channels with biggest market share, as well as Herfindahl-Hirschman Index of concentration are shown in Table 4.

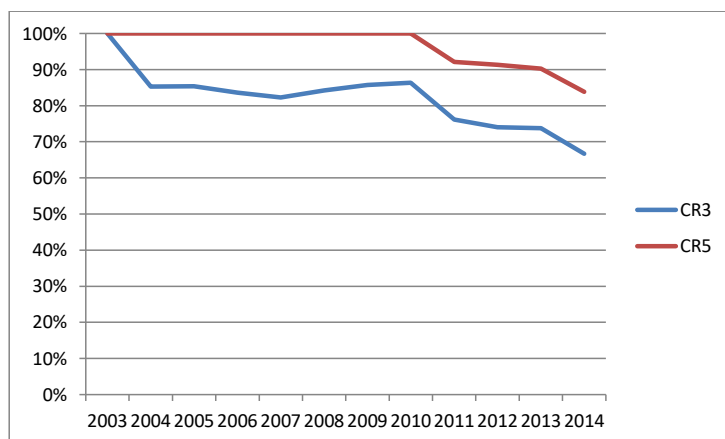
Table 4: Values of Herfindahl-Hirschman Index and concentration ratios (2004 – 2014)

Year	HHI	C3	C5
2004	2887,7	85,28%	100,00%
2005	2942,3	85,38%	100,00%
2006	2768,9	83,62%	100,00%
2007	2720,6	82,26%	100,00%
2008	2732,0	84,27%	100,00%
2009	2747,9	85,78%	100,00%
2010	2694,3	86,33%	100,00%
2011	2137,7	76,17%	92,09%
2012	2067,7	74,05%	91,33%
2013	2075,0	73,77%	90,28%
2014	1764,4	66,69%	83,85%

Source: author's calculation

To demonstrate the trends of Concentration ratios, the values of C3 and C5 are shown graphically.

Figure 1: Concentration ratios for Croatian nationwide TV stations in the period 2004-2014



Source: author's calculation

Concentration ratios C3 and C5 have the negative trend, which means they are diminishing each year. This means that the leading TV channels are losing their share. Here it is interesting to mention that from 2004 to 2010 the leading TV channel was HRT 1, and from

2011 to 2014 the first position was taken by Nova TV, a foreign company. In 2014 the three leading channels have 66.69% of the market, and 5 leading channels have 83.85% of the market.

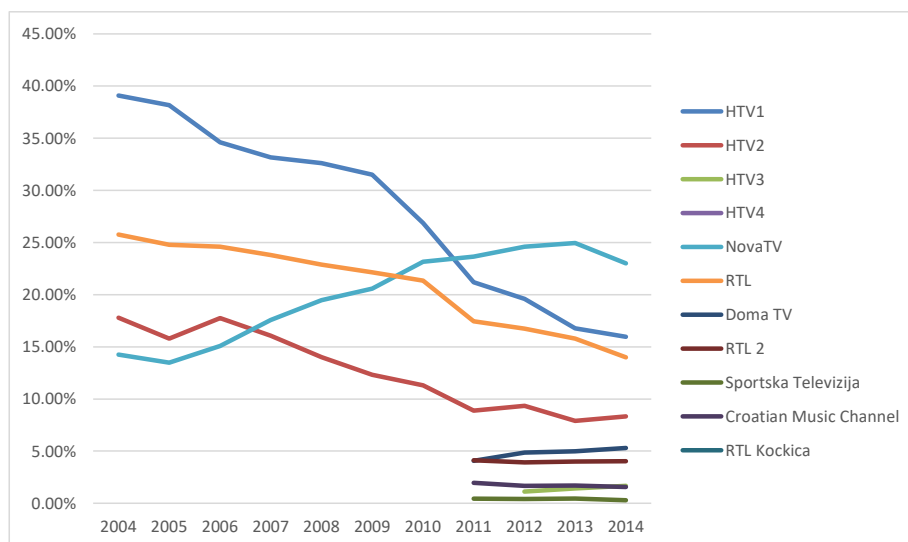
Herfindahl-Hirschman Index of concentration is shown in the first column of the Table 4. The value of HHI has diminished in the analyzed period from 2887.7 to 1764.4. As the value of 1800 is the border between high and moderate concentration level, it is obvious that the value of HHI on Croatian TV market for nationwide channels just crossed the line and from 2014 become moderately concentrated market.

Our results indicate that the Croatian TV market for channels with nationwide coverage is still relatively highly concentrated. The level of concentration has been falling from 2004 to 2014, and if the same trend continues, the market should become moderately concentrated in next few years. This should happen primarily by losing the share of the four biggest TV channels (Nova TV, HRT 1, RTL, HRT 2) in favour of other TV channels with nationwide coverage.

6. Forecasting trends

Based on the data for the period from 2004 to 2014, we calculated the predicted values for market share for each channel that is broadcasting on a nationwide level in Croatia. To predict the values for estimating this trend, first we explored if the changes in market share are approximately linear or not. This can be seen from their graphical comparison.

Figure 2: Market share of Croatian nationwide TV stations in the period 2004-2014



Source: author's calculation

From Figure 2 it is obvious that some trends are close to linear, but some of them are not.

Competing stations on Croatian TV market cannot be regarded as perfect substitutes. They are closed substitutes, and despite the fact that TV stations operate on the same national market, some of them target a special group of people, usually from 18 to 49 years old. On other hand, there is currently no station which is specialized for a niche market, and all stations are intended to broad public.

As already explained before, we have tested 4 basic econometric models for each TV channel. All of these regression models are based on the method of least squares. This method suggests that the difference between the real and expected values of the dependent variable is the smallest possible (Maddala and Lahiri, 2009; McClave and Sincich, 2012), that means

$$\sum_{i=1}^n (y_i - \hat{y}_i) \rightarrow \min$$

The method of least squares is based on the following assumption:

- (a) the expected value of error is zero;

(b) the variance of error is constant;

(c) all errors are independent.

Because of these three assumptions, the method of least squares is considered today as the best model, and it is the most used one in the econometric analyses. The method of least squares is often characterized as BLUE (best linear unbiased estimator), because its estimators have desirable optimal properties.

After analysis of all four models for each TV station, we have concluded that following models showed in Table 5 best fit our data.

Table 5: Chosen regression models for estimating future values

<i>Channel name</i>	<i>Selected model</i>	<i>Coefficient of correlation</i>
HRT 1	$y = 0,4319 - 0,0251t$	$R^2 = 0,9625$
HRT 2	$y = 0,2084e^{-0,09t}$	$R^2 = 0,9301$
HRT 3	$y = 0,0112t^{0,3624}$	$R^2 = 0,9995$
HRT 4	no sufficient data data	
Nova TV	$y = 0,1268 + 0,0122t$	$R^2 = 0,8858$
RTL	$y = 0,2807 - 0,0121t$	$R^2 = 0,9432$
Doma TV	$y = 0,0413 + 0,0085\ln(t)$	$R^2 = 0,9592$
RTL 2	$y = 0,0407 + 0,0006\ln(t)$	$R^2 = 0,1650$
SPTV	$y = 0,0052e^{-0,116t}$	$R^2 = 0,5350$
CMC	$y = 0,0194t^{-0,152}$	$R^2 = 0,9098$
RTL kockica	no sufficient data	

Based on our models, we calculated the predicted values for market share of each of Croatian national TV channels. As for HRT 4 and RTL kockica [\(cube\)](#) there are data available only for one year, there was no possibility to make the trend. Because of this, we

made the assumption that their market share will remain constant over next three years. Under the assumption that all of estimated trends remain the same after the period 2004-2014, as they have been during this period, the calculated estimated values for market share trends are shown in the following table.

Table 6: Predicted values of the market share based on calculated regression coefficients for the period 2015 – 2017 (as % of total TV market)

Channel name	Year		
	2015	2016	2017
HRT1	13,09%	10,58%	8,07%
HRT2	7,08%	6,47%	5,91%
HRT3	1,85%	2,01%	2,14%
HRT4	2,48%	2,48%	2,48%
Nova TV	27,28%	28,50%	29,72%
RTL	13,61%	12,41%	11,20%
Doma TV	5,50%	5,65%	5,78%
RTL 2	4,17%	4,18%	4,19%
Sportska Televizija	0,29%	0,26%	0,23%
Croatian Music Channel	1,52%	1,48%	1,44%
RTL Kockica	2,78%	2,78%	2,78%
<i>Share of national TV channels</i>	<i>79,65%</i>	<i>76,79%</i>	<i>73,95%</i>

Source: author's calculation

The data from [the](#) table show that the share of national TV channels on the total TV market is expected to fall in next three years. To analyze the market shares only for national TV stations, we have recalculated values of market share of all TV stations, as explained before. This is shown in Table 7.

Table 7: Predicted values of the market share based on calculated regression coefficients for the period 2015 – 2017 (as % of TV market for nationwide stations)

Channel name	Year		
	2015	2016	2017
HRT1	16,43%	13,78%	10,91%
HRT2	8,89%	8,42%	7,99%
HRT3	2,32%	2,61%	2,90%
HRT4	3,11%	3,23%	3,35%
Nova TV	34,26%	37,12%	40,19%
RTL	17,09%	16,16%	15,15%

Doma TV	6,90%	7,36%	7,82%
RTL 2	5,23%	5,44%	5,66%
Sportska Televizija	0,37%	0,34%	0,31%
Croatian Music Channel	1,91%	1,92%	1,95%
RTL Kockica	3,49%	3,62%	3,76%

Source: author's calculation

From the table it is obvious that market leader will remain Nova TV with an expected rise in market share. Starting from 2015 RTL is expected to replace HRT 1 on second position. From the four most important TV stations which are being broadcasted in multiplex A (HRT 1, HRT 2, RTL, Nova TV), only Nova TV is expected to rise the share, while other three should lose their market share. All other TV stations (except Sportska Televizija) will experience growth of market share.

Now based on these results, we can analyze the trends in market concentration for the period from 2015 to 2017.

Table 8: Estimated values of concentration ratios and Herfindahl-Hirschman Index (2015 – 2017)

<i>Year</i>	<i>HHI</i>	<i>C3</i>	<i>C5</i>
2015	1920,6	67,78%	83,57%
2016	2017,4	67,05%	82,83%
2017	2158,4	66,25%	82,06%

Source: author's calculation

The concentration ratio C3 should rise in 2015 and then fall in next two years. Concentration ratio C5 is expected to continue diminishing its value through next three years. The value of Herfindahl-Hirschman Index is, contrary to concentration ratios, expected to rise. This can be explained with the fall of market share of second, third and fourth TV station, which is more than compensated by the rise in market share of market leader. Generally speaking, Croatian public TV channels will continue losing their audience, while the majority of other private TV channels will gain new audience.

7. Microeconomic analysis of the market (Market structures)

Market structure is the situation of the market with respect to competition. In the contemporary microeconomics there are four main market structures (Besanko and Braeutigam, 2010; Browning and Zupan, 2011; Hall and Lieberman, 2012; Goolsbee, Levitt, Syverson, 2013):

1. Monopoly;
2. Oligopoly;
3. Monopolistic competition;
4. Perfect competition.

These market structures differ due to the difference of basic characteristics, such as: number of sellers and buyers, product type, barriers to entry etc. The two extremes are monopoly and perfect competition, while oligopoly and monopolistic competition have characteristics of both monopoly and perfect competition.

Monopoly is the market structure in which there is only one producer which produces a product or service that has no close substitutes. This means that a product is unique and that the only possibility for costumers to have the product is to buy it from the monopolist. The monopolistic market is closed for any other company that would like to enter the market. This can be due to different reasons: regulatory, technical or natural.

Perfect competition is the market structure totally different from monopoly. It is characterized by the large number of producers, who all produce the homogenous product. Homogenous product means that all products from different producers look the same from the perspective of buyers in all the main attributes. The entry in the market is totally free, as well as the possibility to exit the market. All producers and buyers have the perfect knowledge about all important information, so there is no problem of asymmetric information.

Oligopoly is the market structure which is close to monopoly, but the main difference is in the number of producers. While in monopoly there is only one producer, in oligopoly there are several producers. They all produce either homogenous product (pure oligopoly) or differentiated product (differentiated oligopoly). All producers are interdependent; every action on the market causes the reaction of all other oligopolists. The process of entering the market is limited, but not impossible.

Monopolistic competition is the market structure which is close to perfect competition, with the main difference in the product type. While in perfect competition all products are homogenous, in monopolistic competition products are differentiated. Differentiated product means that products from different producers are similar, but not the same. The difference between them is important enough that buyers can notice it and decide on buying the product or not, based on this difference.

In the television market from all these four market structures, only three are possible: monopoly, oligopoly and monopolistic competition. Perfect competition is not possible because TV channels are different enough for the audience to notice the difference between them. There are no two identical TV channels in the world. Television programming is not a homogenous product.

The process of development of all national TV markets could be divided into three phases, from which every phase corresponds to a certain market structure. These three phases would be:

- I. phase – monopoly;
- II. phase – oligopoly;
- III. phase – monopolistic competition.

The I. phase occurs at the beginning of the development of TV market. This is usually in the middle of 20th century, when national broadcasting corporations started to broadcast TV

program. All these channels were state-owned and for a certain period these channels had been the only producer of TV programmes in a country. The II. phase begins with the entry of second TV channel on the market. The entry of other TV channels still remains in the II. phase. When the number of TV channels on a certain market is high enough to lower the market concentration, the III. phase begins. This is the current situation on national TV markets of the most developed countries in the television sense, as Germany, France or Italy.

Croatia has spent a long time in the phase I ending just in the year 2000. Today's situation on Croatian TV market can be described as oligopolistic, which means that Croatia is still in the II. phase. The number of TV channels on nationwide level is not so small, but the market concentration is still high. In microeconomic theory there is no specific border between oligopoly and monopolistic competition regarding the number of producers, but even if this number is high and the level of market concentration is also high, such structure would be oligopoly rather than monopolistic competition. Based on all of this, the Croatian TV market for stations on a national level is oligopoly, and taking into account the predicted values of market share and market concentration for next three years, it will remain in the same structure.

8. Conclusion and implications

The Croatian television case example can help other countries to predict developments in their own TV market. Croatia is the EU country closest to Western Balkan countries, who all aspire to membership in the EU. Thus, Croatian data may have valuable implications for Western Balkans and other CEE countries. ~~Croatian—Our research results and experience focusing on Croatia~~ can ~~effectively~~ be applied to ~~their own other~~ national markets ~~when it is customized for the local cultural content~~. Specifically, before ~~new~~ TV channel releases, ~~imported trends~~ foreign TV stations tend to generate generally higher expectations.

The public television HRT was once the monopolist, but with the liberalization of the market, other private TV channels ~~have~~ entered the market taking significant market shares. From the ~~time~~-very beginning when the Croatian TV market became liberalized, the market concentration began to change. The analysis showed the data and the trend from 2006 to 2012, in which the level of market concentration measured by HHI_t has been falling from 2768 to 2123. Concentration level also showed ~~the~~-a diminishing trend, which is the consequence of the rise of popularity of TV channels with lower market share, as well as of the entry of new TV channels in the market.

Generally speaking, Croatian public TV channels will continue losing their audience, while the majority of other private TV channels will gain new audiences. Viewership is now based upon the needs and demands of the marketplace, and the free market is unrestrained by the government. Of greater impact is the globalization of the industry, as the leading firm in the Croatian market currently is a foreign firm broadcasting in Croatia. These firms offer a global perspective and are not influenced by the government and offer programming that will deliver an eclectic view. Transitional governments that are seeking transparency in reporting and programmes chosen only for their success measured by the number of viewers should take note of the privatization outcomes illustrated in our research.

The trend models developed in this paper show that the market concentration in the next couple of years could experience a slow rise. The reason for this is the expected rise of market shares of the leading TV channels. Regarding market structure, the conclusion is that the current market structure on Croatian TV market is an oligopoly, which in a mature market will likely to continue. This is very important information for any possible new TV channel which could enter Croatian TV market and which would be treated as FDI by the European Union. This also has strong positive implications for “first movers” into a newly deregulated market place.

Our research gives further guidance for practitioners in the industry in regard to industry characteristics. Besides TV channels at a national level, there are also TV channels at a local level as well as satellite and cable TV channels. Although the large national providers will continue to concentrate their viewership, substitute products such as cable, internet, dish, etc. will continue to gain market share at their expense. However, due to their power in the industry and number of programmes, they could well integrate into these platforms and stifle competition from these substitutes.

The analysis done in this paper fills the gap in the literature regarding the last 13 EU countries. It is interesting for all these countries, but also from other countries from south-eastern Europe who intend to become EU members, because the market liberalization and regulation processes of these countries are very similar. Our research furthers the relatively little previous research that examines the television market in the EU. The research is important as a case study, because not only does it illustrate past trends in the EU, but is informative for other countries that are deregulating their television marketplaces (such as in the CEE). In all these countries TV market has developed from the monopolistic market to the oligopolistic market due to the change in regulation and further liberalization. Our research illustrates that a deregulated TV market will follow a pattern of monopolistic market to oligopolistic over time, with the former monopoly suffering the greatest loss of market share. Our results indicate further changes in market concentration as specialized TV channels continue to enter the market, and again, with the former monopolistic government TV channel losing the most market share. In the future we expect more specialized TV channels on the national level in terrestrial broadcasting. This will also influence the market concentration. Because of this, we plan to continue working on this topic and to make a more detailed analysis in next 5 years.

One key limitation of our research is that the industry itself is evolving with the advent of cable, internet and satellite providers entering the industry, from outside the marketplace of Croatia. In all television markets globally, this phenomena is causing concern to practitioners in the industry. We also cannot predict if, or how many, new television stations will occur in Croatia within the next years, and what (if any) impact they will have on the market.

The further limitation of this study is that there are no similar studies for countries with similar population and surface as Croatia. On other hand this can also be regarded as an advantage because this is the first paper which can be the incentive for further analysis. In further research we plan to repeat the same analysis in next 5 years and to get the longitudinal analysis. One of the limitations of our study is the lack of the analysis of standard errors of the parameters calculated in the model.

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