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A cross-cultural study of the competition between online and offline media using a two-sided market approach: The media revenue niche dimension

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1. Introduction

McLuhan (1962), who analyzed the history of mankind from a media-centric point of view, emphasized that the emergence of new communication media can change not only the sensory system of mankind but also society at large. Since letters were invented, inventions such as paper, typography, and telegraph have changed the overall social structure in ways beyond the change in human communication. The change caused by the emergence of new media has thus been one of the major research topics in the field of communication.

We are currently at the midpoint of this change, as the emergence of the Internet has brought about a radical change in the media environment. This has caused great confusion not only for users but also for suppliers. Eric Schmidt, chairman of Google, described the Internet as an invention that humans created but do not understand. We acknowledge that the Internet has a large impact on the human race, but we can only give a limited answer as to its specific impact. Numerous scholars and practitioners from various fields have sought to explain it, with new interdisciplinary studies enhancing our understanding.

In particular, there have been many studies analyzing the relationship between the new media domain of the Internet and the domain of existing media. Two of the theories used are displacement theory, in which the Internet and existing media compete to obtain limited resources, and complementarity theory, which emphasizes the ability of different forms of media to complement deficiencies. It is not possible to say that either theory is superior, as their applications have yielded varied results, and the two theories can be applied in a complex way depending on the scope, method, and sample, among other aspects, of a study (Dutta-Bergman, 2004; Lee & Leung, 2006; Ha & Fang, 2012).

Unfortunately, most of the existing studies have failed to capture the perceptions of both suppliers and audiences. Most of them provide analysis based on the industry structure from suppliers' viewpoints or focus on time or gratification from the viewpoint of the audience. This creates great limitations in that the studies do not fully reflect the nature of the two-sided market. The two-sided market is a market in which two types of users or operators interact with each other through a specific platform to create value; two examples are credit cards and PC operating systems. The specific two-sided market that is the media market requires advertisers and users' mutual satisfaction (Filistrucchi et al., 2014).

Another limitation is that existing substitution studies have concentrated on specific countries. Most of the existing research has been conducted in countries where the

Internet has only been partially adopted. However, as the rate of Internet access can be remarkably different despite similar political, economic, and socio-cultural conditions (see, for example, the United States and Japan; La Ferle, Edward & Yutaka, 2000), the adoption of new media can be different for every country. In other words, cultural factors are expected to have an impact (Hermeking, 2006).

With this in mind, this study aims to examine the competition between online and offline media by analyzing media revenue, including advertising revenue and content revenue, in order to reflect the two-sided nature of the media market. As an analytical method, it is expected that the niche analysis of Dimmick (2002) is suitable to reflect the media market's two-sided nature in that it can use various resources such as advertising costs, time, and satisfaction. Furthermore, the cultural dimension of Hofstede (2011) is also examined as a means of providing a cultural approach excluded from the existing studies. If we examine the influence of cultural factors through this lens, it is expected that the influence of culture will be confirmed as the most important factor for which to control, in view not only of the direction of new research but also of the integrated view of existing research results.

2. Literature review

2.1. Media displacement effect

Mainstream studies seeking to identify changes in the media ecosystem due to the emergence of new media have largely been centered on the relationship between new media and existing media, usually in a competitive light. In order to study the relationship between existing media and new media, McCombs (1972) tried to apply the principle of relative constancy by using the media expenditure cost of the audience as an analytical unit. This principle emphasizes that the proportion of media expenditures among individuals' resources does not change much over time. Moreover, since the audience chooses the most convenient and efficient type of media among competitive media performing the same function, the emergence of new media reduces the use of existing media (McCombs & Eyal, 1980; Werner, 1986). This principle can also be interpreted as the concept of time displacement (Mutz, Roberts, & van Vuuren, 1993). The concept suggests that the length of time in a day does not change, so people spend less time on traditional media or other activities as this time is allocated to new media. In reality, Brown, Cramond, and Wilde (1974) found that after television was introduced, time spent on books, cartoons and radio decreased, but time spent reading newspapers was not significantly affected.

However, there have been many cases in which the theory does not apply. When the demand for new media is very high, the proportion of media usage time overall increases (Chang, 2015). In particular, even if the weight of the media is unchanged,

there is a lack of causal logic explaining the unchanging point. To overcome these limitations, some researchers have started to emphasize the concept of “functional displacement” (Kayany & Yelsma, 2000). This concept suggests that displacement effects occur when new media offer the functions of existing media in more effective ways. This view also presupposes that users are able to judge and select among the opportunities to satisfy their media needs (Jeffres, 1978).

In other words, researchers need to consider users’ motivation in explaining media displacement phenomenon. Inevitably, then, researchers have started to apply the uses and gratification theory to study users’ motivation (Stempel III, Hargrove, & Bernt, 2000). If users judge that they can achieve greater gratification through new media, functional displacement effects may occur with regard to existing media. Dutta-Bergman (2004) also applied uses and gratification theory to determine the complementary effect. He argued that users are more likely to use multiple types of media, not just one, to gather information. Indeed, research has found complementarity in a variety of news areas, and Lee and Leung (2006) have also described the uses and gratification theory as a theory supporting complementary effects. However, there are some limitations to this approach based on uses and gratification. In particular, the lack of consideration regarding the selectability of other media or the tendency of usage has been pointed out as a major weakness (Ha & Fang, 2012). Researchers have attempted to overcome this by applying the concept of the niche.

2.2. Niche theory

A niche refers to the space occupied by media in a multidimensional resource space surrounding specific media (Dimmick, 1993). This space is composed of various dimensions such as advertising costs, time, and gratification. Niche theory is distinguished from other comparison methods in that it focuses on the properties of media. Niche theory is a theory derived from biochemistry and is an analytical framework that explains the coexistence and competition of various populations with limited resources based on patterns of resource utilization (Dimmick, Patterson, & Albarran, 1992). This theory has begun to be used as a way to identify the relationship between human assemblages and their environment, providing a view of the social organism on a macroscopic level.

According to niche theory, media can be defined as an organism in a specific environment with limited resources. Therefore, if there are multiple forms of media that depend on the same resources, the competition between the various media for survival becomes more intense and the medium with superior resource acquisition displaces the less effective forms of media. Media may concentrate particular resources by specializing in certain functions and forming complementary relationships.

Since niche analysis of changes in the media ecosystem is based on resources, the most interesting component of studies that have applied niche theory is the selection of

a resource as an analytical unit. In early studies using niche theory, the main resource was advertising expenditures. For example, Dimmick and Rothenbuhler (1984) analyzed the competition among five media using data from the U.S. market during the period from 1928-1982. Dimmick, Patterson, and Albarran (1992), focusing on the development of cable television, analyzed the competition between cable television, terrestrial television, and radio, and suggested that cable television is gradually becoming a competitive medium for terrestrial television. However, there are some limitations in the studies based on advertising expenditures. First, since the ratio of dependence on advertising costs is different for each medium, direct comparison is difficult. Empirical research also poses some challenges because it is hard to collect data related to advertising costs. Because of these difficulties, niche theoretical researchers began looking for other resources, paying particular attention to content rather than the costs of advertising. For example, Hellman and Soramaki (1992) analyzed the content competition between major and independent film studios in the U.S. video market from 1982-1990. In the case of Korea, Nam (1995) analyzed changes in competition due to the entry of the new broadcasting company Seoul Broadcasting System (SBS) into the terrestrial television market.

However, since these studies take macroeconomic approaches to the media industry, they do not consider media audiences very heavily. To overcome these limitations, most studies have identified user gratification and opportunity as a resource for analysis (Albarran & Dimmick, 1993; Stafford et al., 1999; Dimmick et al., 2000; Li, 2001). There are a few studies that have set utilization time as a direct measure of users' actual media consumption. Lee and Lee (1993), for example, emphasized that in order to accurately grasp the displacement or complementarity between media from the viewpoint of users, it is necessary to focus on "actual consumption time" rather than "gratification" or "advertising costs." It is unclear whether gratification is reflected in actual media consumption; meanwhile, advertising costs are a difficult gauge of actual media usage due to various factors.

Taken together, these discussions reveal that resources used in niche analyses are very diverse and have various characteristics. In an explanation of resources, Dimmick (2003) emphasized that macro-level resources such as advertising expenditures are easy to subdivide into micro-level dimensions such as contents and usage time, but there is a difficulty in doing this in the opposite direction. This argument implies the importance of industry analysis on the macro-level, and it can be seen as a reason why advertising expenditures have been considered as a major resource despite the difficulty of data collection. However, considering the multi-faceted nature of media, it is necessary to consider not only advertising costs but also content usage fees.

2.3. Two-sided market

One of the most important concepts in taking an industry approach to the media market

is the concept of a two-sided or multi-sided market. The concept of the multi-sided market can be simplified as a market that is formed through a transactional relationship between two or more different groups, centering on the intermediary (platform), though there may be differences in its applications depending on the viewpoints of scholars (Caiilaud & Jullien, 2003; Armstrong, 2006; Rochet & Tirole, 2006; Filistrucchi, 2008; Hagiu & Wright, 2011; Luchetta, 2013). However, most of the studies emphasize network externality, which means that the profit of one group is influenced by the size of another group (Evans, 2003). Rysman (2009) pointed out that studies on two-sided markets are merely a subset of studies on network effects. Rochet and Tirole (2006), who laid the theoretical foundation for the two-sided market, define the two-sided market as follows:

“A market is two-sided if the platform can affect the volume of transactions by charging more to one side of the market and reducing the price paid by the other side by an equal amount; in other words, the price structure matters, and platforms must design it so as to bring both sides on board.”

Based on these attributes, a number of studies have attempted to confirm whether a particular industry is included in the two-sided market; industries such as media, payment cards, and online intermediaries are representative (Filistrucchi et al., 2014). Like payment card markets where firms sell the use of a card to buyers and a point-of-sale (POS) terminal to shops, these markets provide spaces for various groups. In the case of media, there are audiences who want to watch content and advertisers looking for a route to audiences. Even though there is interaction between the two parties, there is no transaction observed in the media market, meaning that the parties cannot impose one interactive fee per one interaction. Looking at the specific medium of television, Wilbur (2008) quantitatively confirmed the influence of television viewers and advertisers on the television platform. The results indicated that an increase in advertising leads to a decrease in the attention of the audience. While television networks consider both groups relatively balanced in organizing the programming, this study revealed that the choices made reflect advertisers' demands more than those of the viewers.

This study verifies the competition between the online and offline media markets. We apply the concept of a two-sided market to overcome the limitations in existing research that analyzes the media from an industry approach, using only advertising revenue as an analytical unit. Although the two-sided market defines media revenues as a complex influence of stakeholders, for research convenience, we operationally define the overall advertising revenue and content revenue as media revenue. In other words, although this study does not analyze the influence of the relationship between existing advertisers and users in each medium, it considers media revenue the result of this influential relationship. The first research question is as

follows:

RQ1. How do online and offline niche breadth and niche overlap vary by country?

2.4. Cultural dimensions

In addition to the overlooking of the two-sided nature and externalities of the media market, existing studies have failed to take a cultural approach. Since the structure of the media market and the media usage motives of an audience are very diverse depending on culture or country (de Mooij & Hofstede, 2011), the displacement effects of new media are necessarily different.

In particular, since the displacement effects of the Internet are basically based on the acceptance of the Internet, factors affecting the acceptance of the Internet can be applied. An example of this possibility is the United States and Japan. In early 1999, the United States and Japan were very similar in terms of economic size, social and political structures, and language penetration (la Ferle et al., 2002). At the time, however, the Internet penetration rate in the United States was 48.4% (3rd), followed by Sweden and Canada, and the rate in Japan was only 26.7% (9th). This phenomenon confirms Norris's (2001) finding that factors besides economic factors do not affect and Guillen and Suarez's finding (2005) that socioecological factors mainly influence Internet adoption, with some limitations. Some scholars have attempted to solve this problem through a cultural approach.

Although culture is a complex concept that cannot be easily defined (Muller & Gelbrich, 2004), through practical attempts to simplify it, Hofstede (1980) and Hall (1976) suggested various cultural dimensions. In particular, Hofstede identified the four cultural dimensions of *Individualism and Collectivism*, *Masculinity and Femininity*, *Uncertainty Avoidance*, and *Power Distance*, emphasizing the importance of a culture's influence on individual values and behavior. In a subsequent study, the two dimensions of *Long-term Orientation* and *Indulgence and Restraint* were added, making for six cultural dimensions have significance. This has made comparative analysis according to geography or race possible empirically (Hofstede, 2011).

First, *Power Distance* represents dependency within the country. Specifically, it means the degree to which a less powerful group accepts its inequality with a more powerful group. In a country with a large power distance, individuals prefer to obey their bosses and depend on such relationships. People in countries with a large power distance tend to be less innovative because they are encouraged to respect authority, follow directions, and avoid original thinking (Herbig & Miller, 1991). Hence, some studies have found that power distance has a negative impact on Internet adoption (la Ferle et al., 2002; Yenyurt & Townsend, 2003; Gong et al., 2007). Yet Dwyer et al. (2005) found that power distance is positively associated with diffusion rates.

Second, *Individualism* (high score) is used to describe a culture in which individual

connections are loosened, while *Collectivism* (low score) is used to capture a culture with strong social connections. In an individualistic society, individual freedom and development are considered to be important, while in a collectivistic culture, loyalty and harmony with organizing units like the family are emphasized. As a result, individualism sees others as having their own attributes, while collectivism sees others through the prism of the group to which they belong. In contrast to people in a collectivistic culture who conform to their social structures, people in an individualistic culture tend to be highly innovative because they value individual creativity and development. Thus, individualistic countries tend to show higher Internet usage rates than collectivistic countries (la Ferle, 2002; Yenyurt & Townsend, 2003).

Masculinity and *Femininity* are cultural dimensions in which gender-based differences are most prominent. A masculine culture is one in which development or challenge is emphasized, while a feminine culture focuses on management, cooperation, and safety. Countries with masculine cultures show high innovativeness because masculine cultures emphasize displaying markers of individuals' advancement, such as the purchasing of new goods (Steenkamp et al., 1999; Dwyer et al., 2005).

Uncertainty Avoidance refers to the tendency to avoid ambiguity, not risk. It is measured as the extent to which an individual can withstand abnormal situations, like a lack of information or a surprise. In cultures with low avoidance tendencies, the tolerance for new things is high. Individuals tend to dislike rules and are generous about things they do not know. Conversely, in countries with high avoidance tendencies, there is a strong inclination for things to be structured and less openness to innovativeness. Therefore, there is a negative relationship between uncertainty avoidance and Internet penetration (la Ferle et al., 1999; Yenyurt & Townsend, 2003).

Long-term Orientation is a dimension that has its origins in Confucian work dynamism. Confucian dynamism was seen as a cultural dimension used to support the rapid growth of China, but most people changed their names because they did not have an understanding of Confucianism. Short-term-oriented cultures focus on the past; presentation and hospitality are important factors. Conversely, long-term-oriented cultures emphasize the future and have features such as perseverance, abstinence, grooming, and an understanding of good and evil according to the situation. Some studies suggest that people from long-term-oriented cultures show higher rates of Internet penetration, as they perceive greater long-term benefits associated with innovation (Van Everdingen & Waarts, 2003; Gong et al., 2007).

Finally, *Indulgence* versus *Restraint* is a dimension that was added in 2010 and that is mainly related to happiness. In an indulgence culture, people consider themselves to be happy and have leading roles in their lives. They also want to have positive emotions and the proportion of time spent on leisure is high. On the other hand, in a restraint culture, people feel less in control of their own lives, and fewer people feel happier. In these cultures, the proportion of police is high and social norms exert strong influence. Since individuals in cultures of indulgence perceive themselves to have personal control

and greater freedom, they tend to adopt social networking practices in greater levels than people from restraint cultures (Stump & Gong, 2015).

In reality, analyzing the adoption of the Internet by applying these dimensions has proven that cultural factors can have an impact on new media diffusion. Herbig and Miller (1991) asserted that the high individualism and low uncertainty avoidance tendencies in the United States have had a major impact on innovation acceptance, and a number of studies have supported this (La Ferle et al., 2002; Hermeking, 2006; Steenkamp, Hofstede, & Wedel, 1999). However, just as the effects of uncertainty avoidance are not significant in some studies (e.g., Dwyer et al., 2005), different results may emerge depending on the study and the sample countries. Correlations with illiteracy or English penetration have also been found (Yeniyurt & Townsend, 2003).

As the online media market is based on Internet penetration, we assume that the cultural dimensions that influence Internet penetration will affect the online media market. In particular, the cultures that accept the Internet positively will form an online media market based on various media and show high scores on niche breadth. Thus, there will be severe competition between the online and offline media markets, and the value of niche overlap will be close to zero. We thus developed our second research question:

RQ2. How do cultural dimensions affect online niche breadth and online-offline niche overlap by country?

3. Method

3.1 Data

3.1.1 Media Revenue

In order to test the research questions empirically, we used secondary data. First, data from the *Global Entertainment and Media Outlook 2017-2021* report by Pricewaterhouse Coopers (PwC) was used to analyze the structure of media markets by country. This report provides advertising revenues and content revenues for the media markets of 54 countries from 2012–2016. The types of media that the report contains are diverse (e.g. television, radio, books, music, Internet), but we focused on four major mass media—television, radio, newspapers, and magazines—that proved the two-sided market (Wilbur, 2008; Rysman, 2009). The Internet market has a large portion in the online media market, but since it cannot be compared to anything offline, we excluded it from our research.

3.1.2 Niche Analysis

Based on the data, we conducted niche analysis to set the online and offline media niche breadth and online and offline niche overlap by country as the dependent variables. The equation for calculating each value is as follows:

$$\beta = \frac{1}{\sum_{i=1}^n \rho_i^2} \quad , \quad d_{i,j} = \sum_{h=1}^n (p_{i,h} - p_{j,h})$$

Figure 1. Equation for Niche Breadth (B) and Niche Overlap (D)

where p is the proportion of media (online/offline) in i , which refers to a resource category (television, radio, newspapers, or magazines), in measuring B. $D_{i,j}$ denotes the distance between media i and j , and h represents the resource categories utilized by the media (Dimmick & Rothenbuhler, 1984).

In this study, a high niche-breadth value means that the given market uses various media resources (e.g., television, radio, newspapers) more equally, while a low value means that the market depends on a specific media resource. For example, if the online media market uses resources perfectly equally, each of the four types of media's share will be 25%, and the value of the niche breadth will be 4. Niche-overlap measures the relationship between two populations in terms of the similarity of their resource utilization patterns. The closer the value is to zero, the shorter the distance is between online and offline media, and there is the more overlap in resource utilization.

To determine which population is the superior competitor, Dimmick (2003) suggested Niche Superiority based on Schoener's alpha (Schoener, 1974). To figure out the competitive superiority over population i of population j , the formula for niche superiority is shown as figure 2.

$$\alpha_{i,j} = \left(\frac{T_j}{T_i} \right) \left[\frac{\sum_{k=1}^m (d_{i,k}/f_k)(d_{j,k}/f_k)}{\sum_{k=1}^m (d_{i,k}/f_k)^2} \right]$$

Figure 2. Equation for Niche Superiority

where :

T_i/T_j = The ratio of the number of resource items consumed by an individual of population j to that consumed by an individual of population i computed for each

population by dividing the total resources utilized by the population size.

$d_{i,k}$ and $d_{j,k}$ = The frequency of utilization of resource k by populations i and j , where k equals a resource microdimension such as TV or radio.

f_k = The frequency of resource k in the environment, or the total amount of media revenue gained in a particular resource microdimension by all mediums using this resource.

3.1.3 Cultural Dimensions

Next, the cultural dimension conceptualized by Hofstede (2011) was used as a predictor of niche breadth and overlap. The cultural dimension of each country consists of six categories: *Power Distance (PDI)*, *Individualism* (high score), *Collectivism* (low) as (*IDV*), *Masculinity* (high) and *Femininity* (low) as *mas*, *Uncertainty Avoidance (UAI)*, *Long-term Orientation* (high) as *lto*, and *Indulgence* (high) versus *Restraint* (low) as *IvR*. Hofstede provides the cultural dimension scores for 114 countries, but only 50 of these countries are also included in the PwC dataset.

3.1.4 Control Variables

In addition to considering each country's cultural dimension, we used broadband Internet penetration rates from the PwC dataset and country-specific gross domestic product per population (GDP per capita) data provided by the International Monetary Fund (IMF) as control factors that might affect media markets' changes. Finally, we determined the educational level of each country based on data from UNESCO, but the data were not strongly balanced.

Since the online media market, which is the subject of this study, is based on the Internet, it is presupposed that a certain level of Internet should be distributed in the relevant countries. To ensure the robustness of the analysis, the analysis was conducted a second time, this time excluding the lower 10 countries whose Internet penetration rates did not exceed 35%.

3.2 Method

To identify how the cultural dimensions of countries affect online/offline niche breadth and niche overlap, we set up a panel data model. Studies analyzing panel data tend to use Pooled OLS, GLS, Fixed-Effect Model, Random-Effect Model, Difference GMM,

and so on. However, we were unable to use a fixed-effect model or a difference GMM since cultural dimension data are time-invariant variables which would have been omitted in the models. A random-effect model was also not available, as the countries in the sample were not randomly selected. Moreover, in obtaining the best linear unbiased estimator, the Pooled OLS model also presents some problems such as heteroskedasticity, autocorrelation, and exogeneity. Hence, we used the likelihood-ratio test (LR test), which indicates the presence of heteroscedasticity ($p=0.000$), and the Wooldridge test, which supports the presence of autocorrelation ($p=0.000$) in the panel data (Wooldridge, 2001). Thus, we developed a generalized least-squares (GLS) model to control for the problems.

4. Results

4.1 Niche Analysis Results

Based on 5 years of data from 50 countries, we analyzed online/offline niche breadth and niche overlap of various media markets. We compared the data from 2012 and 2016 to see the tendency in changes. The results are shown in Table 1 below.

Figure 3. Results of niche analysis

<i>Country</i>	<i>Online NB</i>	<i>Offline NB</i>	<i>Niche overlap</i>	<i>Online Superiority</i>	<i>Offline Superiority</i>
Argentina	1.86→2.30	1.71→1.60	0.03→0.14	0.0001→0.0001	12009.63→6373.47
Australia	2.12→2.46	2.73→2.37	0.28→0.32	0.0019→0.0071	241.02→52.27
Austria	2.14→2.30	3.10→3.26	0.07→0.11	0.0025→0.0083	333.57→88.92
Belgium	2.81→2.75	3.06→2.90	0.14→0.21	0.0012→0.0026	509.9→188.65
Brazil	2.42→2.78	1.92→1.69	0.03→0.13	0.0002→0.0004	5539.78→1937.67
Canada	3.01→3.02	2.03→1.90	0.27→0.34	0.0007→0.0017	652.6→217.85
Chile	1.74→2.44	1.95→1.82	0.01→0.09	0.0002→0.0004	6370.8→2090.84
China	1.77→2.28	2.92→2.68	0.39→0.32	0.0001→0.0004	3468.52→1019.76
Colombia	1.40→1.97	2.29→2.07	0.06→0.02	0.0002→0.0005	5572.74→1855.57
Czech	2.91→2.96	3.43→3.43	0.02→0.05	0.0010→0.0038	968.63→228.17
Denmark	2.41→2.57	2.87→2.73	0.11→0.17	0.0009→0.0031	838.94→197.86
Egypt	2.54→2.55	1.51→1.55	0.27→0.16	0.0000→0.0001	125278.54→11909.94
Finland	2.63→2.46	3.17→3.17	0.05→0.15	0.0018→0.0094	483.09→68.49
France	2.45→2.21	3.26→3.23	0.10→0.17	0.0028→0.0129	270.42→48.14
Germany	2.91→2.77	3.67→3.58	0.05→0.10	0.0006→0.0033	1334.07→216.33
Greece	2.29→2.48	3.20→2.73	0.14→0.21	0.0009→0.0019	746.04→284.07
Hong Kong	2.75→2.29	3.22→3.27	0.02→0.11	0.0014→0.0060	655.12→123.15

Hungary	2.74→2.66	2.98→2.73	0.04→0.09	0.0014→0.0044	644.83→173.15
India	1.92→2.05	1.87→1.69	0.00→0.04	0.0004→0.0009	2263.68→1050.04
Indonesia	2.09→2.55	2.23→2.00	0.07→0.43	0.0000→0.0001	31987.23→2260.56
Ireland	1.91→2.13	2.47→2.41	0.18→0.26	0.0015→0.0034	442.54→149.17
Italy	2.27→2.87	2.60→2.30	0.01→0.08	0.0027→0.0064	368.11→129.35
Japan	2.51→2.84	2.96→2.85	0.14→0.10	0.0007→0.0032	912.98→231.05
Malaysia	2.46→2.44	2.26→2.25	0.01→0.08	0.0001→0.0005	7429.61→1674.82
Mexico	1.92→2.41	1.82→1.73	0.04→0.08	0.0002→0.0005	4058.93→1611.86
Netherlands	2.56→2.79	3.05→2.81	0.13→0.16	0.0016→0.0069	429.58→87.48
NewZealand	2.71→2.63	3.04→2.82	0.15→0.26	0.0013→0.0042	458.13→102.28
Nigeria	1.83→2.71	2.11→2.00	0.01→0.08	0.0001→0.0002	13296.94→4663.18
Norway	1.73→1.94	2.86→2.74	0.18→0.23	0.0016→0.0049	421.43→114.71
Pakistan	1.83→1.76	2.06→1.76	0.25→0.64	0.0000→0.0001	446488.01→2308.36
Peru	2.07→2.60	2.29→2.30	0.00→0.20	0.0000→0.0004	25554.49→1341.74
Philippines	2.36→2.75	1.84→1.64	0.12→0.33	0.0000→0.0001	53936.06→8602.81
Poland	2.08→2.64	1.90→1.71	0.04→0.11	0.0008→0.0028	1200.18→296.5
Portugal	2.38→2.94	1.96→1.70	0.03→0.21	0.0005→0.0008	2004.49→842.32
Romania	1.24→2.32	1.60→1.41	0.02→0.11	0.0010→0.0023	1021.4→381.91
Russia	2.02→2.15	2.01→1.67	0.05→0.20	0.0015→0.0061	597.47→109.11
SaudiArabia	1.59→2.24	1.50→1.68	0.78→0.24	0.0001→0.0006	2170.08→1025.6
Singapore	1.09→1.94	2.68→2.67	0.11→0.13	0.0013→0.0036	626.04→206.35
SouthAfrica	2.76→2.94	2.57→2.23	0.05→0.23	0.0001→0.0002	10294.13→2458.83
South Korea	2.74→2.99	2.59→2.47	0.08→0.10	0.0015→0.0063	512.71→119.68
Spain	2.20→2.15	2.53→2.16	0.24→0.38	0.0010→0.0019	543.51→188.1
Sweden	2.03→2.46	2.97→3.03	0.10→0.10	0.0012→0.0045	666.65→166.94
Switzerland	2.77→2.95	3.44→3.21	0.06→0.04	0.0007→0.0026	1185.73→335.02
Taiwan	2.75→2.58	1.80→1.77	0.16→0.08	0.0002→0.0014	4132.05→602.96
Thailand	2.80→2.60	2.33→2.04	0.08→0.20	0.0000→0.0001	132942.11→5157.7
Turkey	1.78→2.06	2.21→2.09	0.02→0.00	0.0014→0.0027	693.91→364.76
UK	2.88→2.90	2.82→2.44	0.07→0.17	0.0027→0.0087	300.2→69.75
USA	3.39→3.26	2.02→1.86	0.24→0.32	0.0015→0.0039	338.25→107.41
Venezuela	1.42→2.31	2.13→1.77	0.05→0.04	0.0001→0.0003	11590.12→3258.79
Vietnam	1.55→2.70	1.82→1.5	0.03→0.29	0.0001→0.0004	10740.88→1415.32
* Bold letter means exception of tendency.					

Our comparison showed that online niche breadth had increased in 37 of the 50 countries. This means that in many countries, the online media market is not focused on specific media, but is changing to utilize the four types of media more equally. The largest increase in online niche breadth was in Vietnam (1.55-2.70, +1.14), as the proportion of newspapers in the online media market, once centered on television,

increased. On the other hand, Hong Kong (2.75 → 2.29, -0.46) was the country with the largest decline in online niche breadth. This is because the proportion of magazines, which were the main medium in the online media market, continued to increase.

Offline niche breadth mostly fell, showing a small increase in only 7 countries. These results indicate that in most countries, the offline media market tends to focus on specific media. The country with the greatest decline in offline niche breadth was Greece (3.20 → 2.73, -0.47). The largest proportion of the offline media market was television, which keeps growing. On the other hand, Saudi Arabia (1.50 → 1.68, +0.18) showed the greatest increase in offline niche breadth, and it became more balanced as the weight of newspapers decreased and the weight of television increased. In addition, the highest value for offline niche breadth appeared in Germany, with four media showing the most equal development. Yet in the case of Romania, the offline media market was formed only in the center of television, so the offline niche breadth was the smallest.

Online-offline niche overlap increased in all but 10 countries. In other words, the distance between online media and offline media in the entire media market is quite substantial, and competition is easing. In particular, in the case of Turkey in 2016, the niche overlap value of 0.0008 indicates that the competition between the online media market and the offline media market was very severe. In the opposite sense, the case of Pakistan in 2016 shows a long distance between the online and offline media markets (0.64), indicating that there is almost no competition.

Finally, the online niche superiority increased and offline niche superiority decreased in all countries, and there were no exceptions. Although differences between two niche superiority are numerous, it shows that online competitiveness is continuously strengthening in the global media market. Especially, European countries such as France, Finland, UK, Netherlands and Austria showed relatively little differences. On the contrary, niche superiority differences in Southeast Asia, South America and Africa were large.

In sum, the niche breadth and superiority of the online market increased in most countries, but on the contrary, offline niche breadth and superiority decreased. In other words, the online media market is gradually displacing the offline media market in all resources. However, considering that competition is easing as the value of niche overlap increases, the existing offline media market is becoming increasingly specialize the resource. These results demonstrate that the online market is gradually replacing the global media market, which was formed on an offline basis.

4.2 GLS Model Results

Next, using a GLS model, we confirmed how online/offline niche breadth and niche overlap vary according to the cultural dimension of each country. Before the analysis, we undertook some tests to confirm the characteristics of the data. The LR test ($p=0.000$)

and Wooldridge test ($p=0.000$) showed that the data had some bias, so we controlled for autocorrelation and heteroscedasticity.

In addition, assuming that a certain level of Internet penetration should be required for the development of online media, the analysis was conducted a second time, this time excluding the 10 countries whose Internet penetration rates did not exceed 35% (Model 2, Model 4).

In examining the influence of cultural dimensions on online niche breadth, the positive influences of *Individualism*, *Masculinity*, and *Long-term Orientation* were found in both models. These results are similar to those of earlier studies discussed in the theoretical background of this study and which had found that cultural dimensions are related to Internet adoption (Steenkamp et al., 1999; La Ferle et al., 2002; Yenyurt & Twonsend, 2003; Van Everdingen & Waarts, 2003; Gong et al., 2007). In other words, in countries that are positive about the adoption of the Internet, the online media market can utilize the four media in balance. *Uncertainty avoidance* was found to be significant only in Model 2. It had a significant effect on the online media market only when the uncertainty of the Internet was resolved.

In terms of online-offline niche overlap, only the *Long-term Orientation* dimension was significant in both models. Since small values of niche overlap mean severe competition, these results suggest that in long-term oriented cultures, the online media market and offline media market are engaged in harsh competition. Conversely, it was found that Internet penetration had a positive effect on overlap. It might be interpreted that in countries with high Internet adoption rates, the online media market and offline media market focus on their specific resources. The *Indulgence* dimension was found to be significant only in Model 3; it was not significant in Model 4. Thus, its influence cannot be confirmed.

	Model 1	Model 2	Model 3	Model 4
Dependent Variable	Online Niche Breadth		Online-Offline Niche Overlap	
Variables				
PDI	-0.829 (-0.48)	-0.569 (-0.31)	-0.552 (-1.56)	-0.145 (-0.38)
IDV	6.665*** (-4.6)	6.536*** (-4.68)	0.382 (-1.09)	0.484 (-1.63)
MAS	2.692* (-2.42)	2.675* (-2.55)	-0.188 (-0.59)	0.016 (-0.06)
UAI	0.605 (-0.61)	2.159* (-1.99)	-0.464 (-1.46)	-0.085 (-0.26)
LTO	4.826** (-3.16)	5.660*** (-3.82)	-1.945*** (-4.32)	-1.893*** (-4.98)

IvR	0.142 (-0.1)	1.786 (-1.16)	-0.949* (-2.12)	-0.346 (-0.73)
Internet Penetration	-0.044 (-0.04)	4.553** (-3.15)	0.930** (-2.75)	1.667*** (-4.41)
GDP (logged)	-27.034 (-1.21)	-13.058 (-0.56)	22.673*** (-4.2)	22.691*** (-4.94)
_cons	1977.536*** (-6.47)	1201.735*** (-3.45)	-81.61 (-1.21)	-219.620** (-3.02)
LR Test	Chi ² =154.98 P=0.000***	Chi ² =142.79 P=0.000***	Chi ² =152.80 P=0.000***	Chi ² =130.15 P=0.000***
Wooldridge Test	Chi ² =57.33 P=0.000***	Chi ² =541.40 P=0.000***	Chi ² =412.56 P=0.000***	Chi ² =336.623 P=0.000***
N	250	200	250	200
t statistics in parentheses. * p<0.05, ** p<0.01, *** p<0.001				

5. Conclusion

The purpose of this study is to investigate the competition between the online media market and offline media market by country and to investigate the effect of the cultural dimensions on the competition. First, in order to identify the competition status of 50 countries, we performed niche analysis and presented the results. Previous researches on the competition between the media industry were focused on the advertising expenditure, but this study used the media revenue that combines the advertisement cost and the content revenue considering the characteristics of the media as the two - sided market.

As a result of comparing the niche value for 2012 with 2016 by country, the niche breadth and superiority of the online market increased in most countries. On conversely, offline niche breadth and superiority decreased. In other words, the online media market is gradually displacing the offline media market in all resources. However, considering that competition is easing as the value of niche overlap increases, the existing offline media market is becoming increasingly specialize the resource. These results demonstrate that the online market is gradually replacing the global media market, which was formed on an offline basis.

Next, we conducted panel data analysis to verify the influence of the cultural dimensions on the online media niche breadth and online - offline niche overlap of each country. Since autocorrelation and heteroskedasticity found in the data, the GLS model was designed to control the bias. In addition, in order to obtain more robust research results, the analysis was conducted once again except for the lower 10 countries among the 50 sample countries whose internet penetration rate did not exceed 35%. This is

because the online media market is centered on the internet, which requires a certain level of Internet penetration.

As a result of analyzing online media niche breadth, it was found that countries with individualism, masculinity, and long - term orientation tend to use various media in the online media market. This result can be interpreted like the acceptance and innovation of new technologies such as the internet depending on the cultural dimensions as mentioned above. Next, the cultural dimension that affects the niche overlap between the online and offline media market was examined, and only the long - term orientation had a negative effect. In other words, the stronger the long-term oriented tendency of the nation, the more competition between online media and offline media can be seen. On the contrary, countries with a higher penetration rate of the internet show that competition is eased.

This paper demonstrated the online media market is displacing offline media market in the world. Since previous studies have tested the displacement effects of the internet on a few specific countries, this study is expected to have some implications as it performed integrated analysis of a number of countries. Especially, it was expected that more accurate analysis was made by adding A to the advertising cost which is used as the main unit of media analysis. After identifying the overall trends of the world countries, we analyzed the reasons why the tendency of substitution differs for each country through cultural dimensions. As a result, it has been verified empirically that the online media market can be changed according to the cultural tendency of each country as well as the environmental condition such as internet penetration rate.

However, this study has some limitations. First, the biggest limitation is the fact that we analyzed the competition of the online media and offline media market depending on only four mass media. It is obvious that these four media have a large portion of the media market, but various media can be included in the market. However, this study focuses on the characteristics of the media as a two-sided market, so it is inevitable to exclude media that do not show certain characteristics such as network externalities. In addition, the Internet market is excluded, even though we agreed it plays an important role in the online media market, because it is not suitable for comparison with offline media and also the definition of the market is not clear. If various media are reflected in future research, it will have abundant implications for research.

Secondly, there is no sufficient gathering of the second data. Data from only 40 countries used in the final analysis did not seem to have sufficient generalizability. And data such as education rates or literacy rates that would affect the results of the study were excluded from the study due to lack of samples. Also, in verifying the influence of culture, reliance on Hofstede's cultural dimensions can also be a limitation. The concept of culture is so complex that it would require a broader application.

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