
융합미디어 확산에 영향을 주는 산업, 기업전략 요소에 관한 연구 - 해외 IPTV 실증분석

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A Study of Industrial and Firm's Strategic Factors Affecting Diffusion of Convergent Media - The Case of Global IPTV Services

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요약 본 연구는 해외 IPTV 시장분석을 통해 디지털 융합서비스 확산에 영향을 미치는 산업적 요인과 기업 전략적 요인을 탐색하는 것이 목적이다. 연구를 위해 산업조직이론의 SCP 접근법에 근거하여 주요 변수를 도출했고, 해외 20개국 31개 IPTV 사업자를 대상으로 데이터를 수집했다. 데이터 분석결과 인터넷 보급률과 유료방송 지배사업자의 시장점유율은 IPTV 보급과 양의 상관관계를 보였고, 유료방송 보급률, 일인당 지불금액, 기업전략 요인은 영향을 주지 않는 것으로 밝혀졌다. 본 연구는 탐색수준이지만 해외시장 분석을 통해 디지털 서비스 확산과 시장 변수관계를 밝혔다는데 의의가 있다. 따라서 본 연구는 각 국가별로 시장특성에 맞는 디지털 융합정책 수립에 도움을 줄 것으로 기대된다.

주제어 : 융합, IPTV, 산업요인, 유료방송, SCP 접근법

Abstract The study aims to explore industrial and firms' strategic factors affecting diffusion of digital convergence by studying major global IPTV markets. Market and firm variables are selected using the Industrial Organization's SCP approach. Data for the variables are collected from global 31 IPTV operators representing 20 countries. The analysis indicates that the penetration of broadband Internet and the market share of a dominant player in the Pay TV positively affect the penetration of the IPTV service, whereas the penetration of Pay TV, ARPU, firms' strategy and resource do not have influence on its penetration. The study is the cross-country analysis and contributes to the media study by exploring the relationship between market variables and the development of convergent media. Consequently, the study is expected to help policy makers tailor their digital policy for local environment.

Key Words : Convergence; IPTV; Industrial Factor; Pay TV; SCP Approach

1. Introduction

Declining cost of information processing power and the development of open standards are driving the convergence between media and telecommunications [16]. As result, a variety of convergent media services such as IPTV, Internet and mobile broadcastings rush to the market. As convergent media enter the market,

the media market becomes more complicated than ever. This situation offers significant business implications to telecom operators. Telecom operators have long faced increasing threats from cable companies as cables deliver broadband Internet service over their network. On the other hand, telecom operators have the incentive to leverage existing assets to stimulate new

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논문접수: 2012년 8월 12일, 1차 수정을 거쳐, 심사완료: 2012년 9월 14일

revenue stream. IPTV is regarded as an effective way of both defending telecom's legacy business and attacking the media market.

However, the IPTV offering is successful in some regions of the world but not in most others. The differences in performance are due to diverse factors, including the initial situation of general TV supply, the level of competition in broadband and IPTV markets, broadband penetration, and regulatory constraints [24]. IPTV operators worldwide face different market conditions and as a result they pursue their own business strategy leading to various performances.

Many studies analyzed media policy and its impacts on the changes in industry structure, firms' strategic behaviors and market performance [13],[14],[16],[9]. Some studies explored country factors which explain the different penetration of media services in several countries [18],[25]. However, none tried to generalize industrial and firms' factors which explain the development of media services in the global market.

This study explores industrial and firm's strategic factors affecting the development of IPTV service by analyzing major IPTV markets. This article attempts to include telecommunication market in analyzing the media industry. Although this is exploratory and not intended to empirically prove the relationship between market variables and performance, this aims to contribute to the advance in cross country study for convergent media.

2. Related Study

2.1 Literature Review

Many researchers examined the relationship among market structure, firms' conduct and performance in the media market. Kim and Lee (2006) studied how ownership structure in broadcasting companies affects content diversity [12], and Lee, Y. (2006) evaluated the role of market size and competition on market performance in Korea [14], and Kim and Kim (2007) analyze how competition and de-regulation in Korean

cable market influenced program diversity [10]. Lee and Jung (2009) empirically explained how cable market boomed up and led to significantly low ARPU in Korea [14]. Lee and Kim (2011) empirically analyzed the vertical integration between program providers and service operators in the Korean cable market and proved its influence on foreclosure in Korea [13].

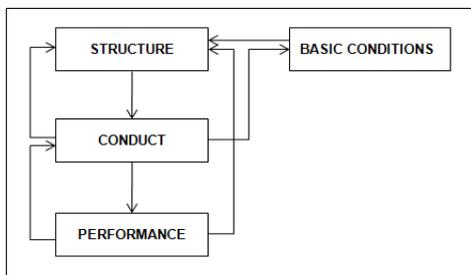
Chon (2003) examined structural change in the media industry since the Telecommunication Act of 1996 in US, and concluded that this de-regulation changed market structure [6]. Bae and Baldwin (1998) examined major factors affecting the growth of the cable market in Korea and concluded that the separated structure of PP(program) provider, SO (system operation) and NO (network operation) led to slow market growth [4]. Oba and Chan-Olmsted (2005) compared market conditions and performances in Asian ten (10) countries, and illustrates how different factors in the selected countries explain different market performances in cable service [18]. Schejter and Lee (2007) explained how government policy had impact on cable market's performance by comparing cases in Korea and Israel [24]. Li and Chen(2007) compared fifty one (51) cable service areas in Taiwan and argued that competition resulted in the increased service quality. These studies demonstrated industrial factors leading to success from the industrial perspectives [16].

2.2 Analytic Framework

This study chooses market variables using IO (Industrial Organization) theory. The IO theory has been widely used by media economists to examine various issues in the media industry [2]. The IO model focuses on the three concepts when examining market: Structure, conduct and performance (hereafter "SCP"). The essence of the SCP approach is that market performance is determined by the conduct of the firms within that market, and that firm's conduct is determined by various market structure variables [27]. Structure is also governed by basic conditions such as technologies, policy and demand factors [26]. The

relation among attributes are shown in figure 1. The causality between structure and conduct can run the other way. For example, a firm's conduct can shape the market structure within a firm operates.

In the SCP framework, each of structure conduct performance can be further defined by considering specific variables. Structure presents relatively stable feature of the market, expressed as number of sellers and buyers, diversity of products or services, entry and exit barriers, level of vertical and horizontal integration [27],[18]. Conduct is firm's strategic behavior in response to competition in form of pricing, product, marketing, and R&D investment. Performance has two different aspects; Economic and political ones. Economic one is companies' business performance such as the increase of market share, profit, etc, whereas political performance is media's obligation for the public such as contents diversity [8].



[Figure 1] SCP framework for media study

3. Research Question

To explore market and firm attributes determining the penetration of IPTV in various countries, this study proposes the following research questions.

Question 1: What are the differences in structure of the pay TV market, conduct and performance in major IPTV countries?

Question 2: What industrial and firms' strategic factors affect the penetration of IPTV service in the global market?

4. Research Method

The study analyzes market and operation data collected from 20 global IPTV markets. Based on the assumption that market structure and firm's conduct are ahead of market performance by two years, firm's performance data has been collected for the end of 2009 and market structure and firm's conduct data for 2006 and 2007. Data sources include such authorized institutes as OECD, Ofcom, research firms, government official web sites, company web sites, and etc.

4.1 Selection of IPTV Operators

31 IPTV operators from 20 countries are selected for the study (table 1). All countries belong to one of Europe, North America or Asia countries. The reason is that IPTV service is relatively well developed in these regions. The selected operators have been operating the service more than three years as of 2010 with diversified backgrounds.

<Table 1> The list of IPTV operators

Country	Operators(In Service)
USA	Verizon(2005), AT&T(2006)
Canada	MTS(2004), Aliant(2005)
UK	BT(2006), Tiscali(2003)
France	FT(2003), Neuf Cegetel(2005), Free(2003)
Germany	DT(2006), Hansenet(2006)
Italy	FastWeb(2001), Telecom Italia(2005)
Spain	Telefonica(2004), JazzTel(2007)
Sweden	Telenor(2004), Telia Sonera(2004)
Dutch	KPN(2005), Tele2(2005)
Switzerland	Swisscom(2006)
Portugal	Portugal Telecom(2007)
Belgium	Belgacom(2005)
Austria	Telekom Austria(2006)
Czech	Telefonica O2(2006)
Hungary	T-Online(2006)
Poland	TPSA(2006)
Japan	KDDI(2003), Softbank(2003)
Taiwan	Chunghwa Tel(2004)
China	China Telecom(2006)
Honk Kong	PCCW(2003)

Source: OECD [19], Roland Berger Consulting [24], Atlas Research [4], various newspapers, homepage, annual reports

4.2 Market Attributes

4.2.1 Basic Condition

Cable or satellite TV are major services in pay TV market and they possibly affect the penetration of new convergent service such as IPTV service. The penetration and ARPU (Average Revenue Per User) of pay TV services are chosen as basic factors. Statistics for these two factors was taken for the year when an IPTV operator enters the market. The penetration of the Pay TV significantly differs by country. For example, when IPTV operators came to the market in US, Canada, Netherlands, and Twain, the cable and satellite TV penetrated to higher than 80% households. In contrast, Italy and Spain began the IPTV service with lower than 20% pay TV penetration. ARPU of pay TV service also significantly differs by country. It is higher than \$50 in US and many of European countries such as UK, France, Spain, whereas less than \$20 in Taiwan and some of European countries such Dutch, Belgium

Internet infrastructure is an important factor expected to affect the development of IPTV service because IPTV carries multi-megabit video contents over Internet. Therefore, this study assumes that broadband penetration is one of governing variables determining IPTV development. Broadband penetration ranges from 31% in Italy to 83% in Hong Kong in 2007.

4.2.2 Market Structure

Competition is one of key variables presenting market structure. Measures to assess competition and concentration basically rely on one of two available tools: CR (Concentration ratios) and HHI (Herfindahl – Hirschman Index) [2]. CR provides an instant way to measure concentration using either the top four firms or the top eight firms within a market. The HHI squares market share for each company and then sums each to generate the total. However, as most media markets are in limited oligopoly (three to five firms) and the consolidation among competitors becomes increasingly popular [2], it is difficult or meaningless to

measure concentration of top several companies. Thus, this study uses market share of one leading player as structural variables.

The degree of concentration significantly depends on policy. For example, FCC of the US maintains 30% market share cap on cable TV operators but most European countries don't regulate market share limit. As result, in 2006, Comcast, the largest cable company in the US, had 21% market share in the pay TV market and Roger cable in Canada 22%. In contrast, BSKyB of UK, Sky Italia of Italy, and Telenet of Belgium served 70%, 94% and 60% of total pay TV customers respectively in 2006 [21].

4.2.3 Conduct

Conduct is expected to have crucial influence on how fast IPTV spreads out. Service period and network ownership are chosen for conduct variables for this study. Service period highly depends on regulatory environment. Therefore, some IPTV operators in European countries and Hong Kong started their IPTV service in early 2000 but some in mid 2000s. Statistics indicate that some of European IPTV operators leased network from incumbent telecom operators (For example, Neuf and Iliad of France) and some use their own and leased networks (For example, FastWeb of Italy and Hansenet of Germany) [19].

4.2.4 Performance

Performance can be measured in various ways – The number of subscriber, penetration, revenue or profit, ARPU, or saved marketing cost, etc. Household penetration is selected for the analysis because it compensates different population by country and other factors are indirectly influenced by penetration. At the end of 2009, PCCW served almost 50% Hong Kong households, and Iliad of French, Portugal Telecom and Belgaco served more than 10% nation's households. However, IPTV service providers in US, UK, Japanese three of French IPTV operators are under-performing with less than 3% household penetration.

4.3 Data Summary

〈Table 2〉 Input Data

Operator	Pay TV Penetration	Pay TV ARPU (\$)	MS of 1st player	Broadband Penetration	Service Period (Yr)	Network Ownership	IPTV Penetration
Verizon	90	57	22	50	5	1	2.4
AT&T	90	57	22	50	4	2	1.8
MTS	93	45	21	64	6	1	1.2
Aliant	93	45	21	64	5	1	0.3
BT	46	59	70	62	5	1	2.2
Tiscali	40	59	70	62	4	3	0.6
FT	42	58	35	57	7	1	8.6
Neuf cegetel	41	58	35	57	5	3	3.4
Free(Ilid)	42	58	35	57	7	3	11.5
DT	64	20	41	55	4	1	2.2
Hansenet	64	20	41	55	4	2	0.1
FastWeb	10	68	94	31	9	2	1.0
Telecom Italia	16	68	94	31	5	1	1.8
Telefoniaca	20	58	54	45	6	1	4.2
JazzTel	25	58	54	45	3	2	0.1
Telenor	80	22	45	71	6	2	3.0
Telia Sonera	80	22	45	71	6	1	8.7
KPN	92	16	49	74	4	1	1.2
Tele2	92	16	49	74	5	3	4.5
Swisscom	75	14	62	64	4	1	6.8
Portugal Tel	76	28	67	39	3	1	12.2
Belgacom	88	14	60	60	5	1	16.1
Telecom Aus.	85	18	18	55	4	1	2.8
Telefonica O2	30	33	52	38	4	1	4.0
T-Online	67	16	32	42	4	1	0.9
TP sa	48	21	15	38	4	1	0.8
KDDI	46	46	15	59	7	1	0.3
Softbank	46	46	15	59	7	1	1.4
Chunghwa Tel	85	17	20	61	6	1	8.7
China Tel.	46	3	10	23	4	1	0.8
PCCW	42	14	100	83	7	1	48.4

1. All local currencies were converted to US dollar
2. Hungary's ARPU is based on fee of basic package of UPC
3. Data for China and Hong Kong's market share of the leading players are estimated

- Note
4. 1 is assigned for own network, 2 for mix of own and leased network, 3 for leased network
 5. Consolidated market shares are applied when M&A took place.
 6. Some IPTV subscriber numbers are extrapolated to fit to the end of 2009
 7. Most recent data are applied when exact data are not available

- Source
1. Pay TV penetration: Ofcom [21], OECD [20], IP-Network(2009), Taiwan National Communications Commission, newspaper, author's manipulation
 2. ARPU: Ofcom [23] - US, Canada, UK, France, Germany, Italy, Spain, Sweden, Netherland, Poland, Japan, CRA [7]- Swiss, Portugal, Belgium, Austria, Telefonica 2009 Annual Report - Czech, UPC's homepage - Hungary, CASBA 2008 - Taiwan, BDA - China, PCCW's press release - Hong Kong
 3. Market share: Ofcom [21], OECD [20], Canadian Media Research [5], 20060 <http://www.cyfrowypolsat.pl> (Poland), Newspapers, Online sites
 4. Broadband penetration: OECD [20]), government official websites
 5. Subscriber: Point Topic, Informa (2008), online newspapers, conference material, Interview, annual report, company press release, UNEC for Europe - number of households in Europe, country websites - number of households in US, Canada, Asian countries.

5. Result

Correlation has been examined using SPSS and presented in the following table. The analysis indicates that the market share of a leading pay TV provider and the penetration of broadband Internet positively affect the penetration of IPTV. In contrast, the penetration of the Pay TV, ARPU, service period, and use of own network do not have impact on the performance. This indicates that early deployment of the IPTV service and less penetrated pay TV didn't ensure successful IPTV deployment. Furthermore, low ARPU and use of own network do not make difference in performance. However, it should be noted that IPTV service is well promoted in highly concentrated market, for example, in many of European countries and Hong Kong. This implies that most of European countries deregulated the media market and promoted the consolidation among players within a market. Such environment turned media market to more concentrated ones but proved to help convergent media to expand more easily.

6. Conclusion

This paper explored industrial and firms' strategic factors affecting the dispersion of convergent media by analyzing market and operation data of major global IPTV operators. The analysis demonstrates that IPTV service has been relatively well performing in the market where broadband Internet is well implemented and/or a leading pay TV player have higher market share. On the other hand, service period, pay TV penetration, pay TV ARPU and network ownership doesn't lead to different performances in IPTV penetration.

The study brings several implications. It confirms that the growth of IPTV service is governed by both telecommunication and broadcasting markets because it is a convergent service between them. It is also evident because Internet broadband plays a key role in delivering broadcasting contents. Second, the analysis implies that media regulation should shift its focus from market concentration to firm's conduct. The

〈Table 3〉 Correlation among variables

		V1	V2	V3	V4	V5	V6	V7
V1	Pearson Correlation							
	P-value							
	N							
V2	Pearson Correlation	-.508**						
	P-value	0.004						
	N	31						
V3	Pearson Correlation	-.426*	.181					
	P-value	.017	.331					
	N	31	31					
V4	Pearson Correlation	.497**	-.232	.039				
	P-value	0.004	.209	.835				
	N	31	31	31				
V5	Pearson Correlation	-.314	.373*	.171	.226			
	P-value	.086	.039	.358	.221			
	N	31	31	31	31			
V6	Pearson Correlation	-.105	.305	.066	.149	.195		
	P-value	.575	.095	.724	.425	.293		
	N	31	31	31	31	31		
V7	Pearson Correlation	-.019	-.269	.446*	.406*	.235	-.127	
	P-value	.920	.143	.012	.023	.202	.497	
	N	31	31	31	31	31	31	

V1: Penetration of pay TV, V2: ARPU of pay TV, V3: Market share of the largest pay TV operator, V4: Penetration of Broadband Internet, V5: Service Period, V6: Ownership of Delivery Network, V7: Penetration of IPTV service

* p-value <0.05, ** p-value <0.01

market concentration has long been regulated in the media industry under the belief that it harms market efficiency and cultural diversity. As the global media market has been undergoing significant change accelerated by the advance of digital technologies, recent media studies start to stress the importance of strategic behaviors by firms [27],[12]. This trends are implicit in this study. This article demonstrates that Pay TV market is highly concentrated but IPTV service is well developed in many European countries. Therefore, it is reasonable to assume that many European countries well promote fair competition environment between incumbents and new entrants by regulating a leading player's unfair competitive actions. This lead to the implication that government media policy need to pay more attention to firms' conduct than market structure.

The study doesn't attempt to empirically prove reliable casual relationship between market variables and performance because the number of samples is limited. However, this study contributes to the media study by including many telecommunications variables in the analysis of convergent media and by exploring industrial and firm's strategic factors affecting convergent media applicable for the global market. Therefore, this analysis will provide the basis for future studies attempting to investigate cross country media market. Also the study will provide many policy makers with useful information in designing stimulus programs for new convergent media service.

However, the study has some limitations. First of all, it doesn't consider firm's diverse conduct factors due to difficulty in acquiring proper data. It is likely that a firm's strategic actions result in different performance even when market structures are similar. Second, exogenous variables are not fully incorporated in the analysis. As Albarran and Chan-Olmsted (1998) stated, market structure, firm's actions and performance are highly affected by exogenous factors such as economy, consumer factors [1]. Third data for some markets are not fully mature as indicators, which implies that small

errors in data can significantly mislead.

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