Willingness to pay for over-the-top services in China and Korea

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ABSTRACT

The increasing penetration of broadband and multiscreen availability has encouraged the development of premium video consumption through over-the-top (OTT) services. Netflix, the leading global OTT provider, is aggressively expanding its international operations and has ambitiously entered the Asian market. To prepare for the shift that the streaming service giant will bring, a proper understanding of consumer acceptance and intent to pay for OTT services is crucial. Therefore, this empirical study uses conjoint analysis to investigate the key attributes and to examine consumers' marginal willingness to pay (WTP) for OTT services. We identified recommendation systems, resolution, and viewing options as important product attributes of OTT services that influence the WTP of Chinese and Korean consumers. The most important attribute for Chinese consumers of OTT services was resolution, followed by the recommendation system and viewing options. For Korean consumers, the recommendation system was ranked as the most valuable attribute, followed by viewing options and resolution. The overall WTP of Chinese consumers was 22.6 yuan (3.4 USD) per month, while Korean consumers' intent to pay amounted to a total of 3530 won (3.1 USD) for OTT services.

1. Introduction

The rapid growth of broadband network and smart devices has changed the pattern of content consumption and encouraged the development of various over-the-top (OTT) services. OTT is defined as "video content offered through an Internet or other Internet Protocol (IP)-based transmission path" (FCC, 2015). The leading global OTT provider is Netflix, which now offers services in over 190 countries worldwide with a subscriber base of 83 million, of which 35 million members are projected to be international members outside of the USA. Around one-third of its revenue comes from international markets.[i] Netflix continues to expand its international operations and is ambitiously seeking to enter the Asian market. On September 2, 2015, Netflix marked its first entrance into the Asian market by launching its service in Japan. On January 2016, Netflix surprised the industry by announcing a simultaneous launch in 130 additional new regions, including Korea, in a move that marked "the birth of a global Internet TV network."

Despite forecasts that Netflix would collaborate with local IPTV providers in Korea, the global OTT service provider started its business as a stand-alone OTT service. Some anticipate that Netflix will shake up the current video content consumption paradigm by offering a wide variety of global content and a marketing mindset unseen among incumbent Korean content providers. However, others doubt the impact of Netflix due to the sluggish growth and mediocre performance of current OTT players in Korea. With a one-month free trial period, Netflix Korea is eager to reach out to domestic users. However, the impact of Netflix seems quite meager

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[i] http://ir.netflix.com (Accessed date: 2016, July 24)

in comparison with early expectations, due to various reasons possibly including its comparatively high price.

Netflix plans to reach 200 countries and officially enter mainland China in the near future (Forbes, 2015a). China is a lucrative market for OTT services. With low pay TV penetration and robust population growth, China's pay TV market assures incumbents and new players significant profit potential (Forbes, 2015b). Successful expansion into China is vital for major OTT players like Netflix as it promises an increase in subscribers, profits, and revenues for future investments in high-quality original content (Shaw, 2016). Unfortunately, Netflix is challenged by strict government control and piracy issues in China. While many users illegally download or watch online videos for free, potential local allies such as Alibaba Group Holding Ltd., Baidu Inc., and Tencent Holdings Ltd. offer similar video services. Global OTT players need a comprehensive understanding of the market and discrete strategies to expand their operations successfully.

Given the characteristics of the Korean and Chinese markets, it is difficult to predict the impact of Netflix on the OTT industry. To prepare for the shift that the streaming service giant will cause, a proper understanding of consumers' acceptance and intent to pay for OTT services is crucial. Especially, China and Korea are both regarded as good test markets for the study of OTT services. First of all, China has a very large population and huge market size. Furthermore, since the OTT industry in China is still in its infancy, it has enormous growth potential. Korea has been regarded as an important test bed in the IT industry, and it is drawing attention of various OTT service providers including Netflix due to its high penetration of video and broadband. Since the Asian OTT market is perceived to have significant growth potential, studying the cases of China and Korea are important reference for business growth in Asia. One key determinant of success will be pricing, because Netflix has a strong price competitiveness overseas compared with the expensive cable subscription fees in the USA. However, critics doubt that Netflix's subscription fees will be a competitive factor in Korea and China, where consumers are considered to have lower willingness to pay (WTP). In assessing Netflix's potential success in Korea and China, this paper identifies how Korean and Chinese consumers perceive the potential utility of a successful global streaming VOD service by assessing their marginal WTP (MWTP) for OTT services. This paper not only evaluates the potential value of OTT services to consumers, but also indicates practical implications for current and prospective video content providers in terms of promoting strategies.

The remainder of the paper proceeds as follows. Section 2 reviews the OTT market based on previous work on OTT services. Section 3 describes our research design, including important attributes defined for the purpose of a conjoint analysis, which is a way of constructing discrete choice sets and survey design. Section 4 explains the methodology of the research, that is, a random utility model used to estimate consumers' MWTP. Section 5 presents the results of our study and Section 6 adds conclusions and implications.

2. Literature Review and Theoretical Background

2.1. Overview of OTT services

Increasing broadband penetration and multiscreen availability have encouraged the development of premium video consumption through OTT services. Derived from the concept of a TV set-top box, an OTT service is generally understood to be the distribution of online premium video content using Internet Protocol (IP) over a public network (Goncalves, Evans, Alves, & Ballon, 2014). The FCC offers a similar interpretation, yet specifies that the service comes from online video providers (OVDs) that offer video content through an "Internet or other Internet Protocol (IP)-based transmission path provided by a person or entity other than the OVD" (FCC, 2015). Slight variations may exist, but the literature on OTT video services consistently emphasizes that they must bypass multiple-system operators such as cable or satellite TV and deliver content via broadband connections (Hansell, 2009; Kwon & Lee, 2015).

The development of OTT services has attracted consumers, who can watch content anytime, anywhere, and on any device (Moyler & Hooper, 2009). With Netflix as the pioneer OTT service provider, numerous players of different origins have joined the bandwagon to participate in the new trend. For example, OTT services are delivered through platform and device providers (e.g., Apple), network operators that enable consumers to watch content on multiscreen formats (e.g., Comcast), VOD platforms and content providers (e.g., Netflix), and TV operators that allow consumers to catch up with TV content (e.g., BBC's iPlayer). Kwon and Lee (2015) also include mobile IPTV and Stick OTT service providers as an example of a new mix of platform, content, and device-related services.

The global OTT market has grown significantly from $4.2 billion in 2010 to $21 billion in 2014 and is expected to reach $51.1 billion by 2020 (Digital TV Research, 2015). The global OTT video market is perceived to have significant growth potential as consumers continue to adopt OTT subscription video on demand (SVOD) services (PWC, 2015). North America's TV market has the most active established OTT players so far. The dominant success of Netflix has disrupted the domestic TV landscape and challenged traditional players to offer new OTT services and content. Therefore, the efforts of HBO's new stand-alone SVOD service, Amazon Prime, to create original content, and AT & T's acquisition of DirecTV are some examples of how the TV industry is evolving within the USA.

While consumers benefit from the rival services that companies offer, competition between OTT service providers are pushing companies to search for foreign markets. Netflix, the largest provider of paid streaming services, dominates as the pioneer in extending its OTT services to international markets. Since the company launched its online streaming service in 2007, Netflix has aggressively entered and dominated the OTT markets of other countries. Beginning with Canada in 2010, Netflix has acquired significant market share in Latin America and Europe. Now the company is strategically targeting the Asian market. After entering Australia, New Zealand, and Japan in 2015, Netflix entered Korea in January 2016 and ambitiously seeks to enter China in the near

future.

China's market size and immature stage of development offer ideal conditions for global companies to enter. PWC (2015) reports that China remains the largest subscription TV market, with 90% of subscribers watching cable TV and 10% watching IPTV. Aware of its relatively slow industrial development, China has recently accelerated the digitalization of the TV industry. The most notable innovation is the rise of OTT players and the online video industry. In 2011, when online video streaming service was first introduced, Youku Tudou was the dominant service provider. However, the media landscape rapidly changed as new competitors like Baidu, Alibaba, and Tencent (commonly referred to as "BAT") entered the online video market. By 2014, Youku Tudou was the front-runner in the market, followed by Baidu's iQiyi service and Tencent Video (CNNIC, 2015). In June 2015, Alibaba announced that it would launch OTT SVOD services similar to that of Netflix in the USA. Alibaba's announcement sparked a new wave of competition as the company had acquired 16.5% of Youku Tudou's stake and exclusive contracts with a production company, Lionsgate (Bookman, 2015).

Despite the increasing size of the video streaming market in China, the means by which revenue can be generated remain obscure. Although China's OTT services are delivered by major Internet companies, the services are a mix of free and premium services. By default, most users can access contents for free through the main OTT service providers by watching advertisements. One of the challenges that OTT service providers face is the weak intentions of consumers to subscribe to online video services. According to CNNIC (2015), even though each company has high percentages of loyal consumers and service usages, the convergence rate for paid subscriptions is reported to be significantly low. Except for Youku Tudou that has 10.7% of paying OTT subscribers, the rest of China's dominant OTT players have difficulty in raising profits from subscribers. To meet the future expectations of domestic and global OTT players, ways to enhance profitability from consumer subscription will need to be explored.

In Korea, OTT services are signaling their presence in the broadcasting market as they threaten incumbent pay TV providers, inducing the latter to enter the OTT market aggressively. Major OTT players in Korea include pooq, the N-screen service of terrestrial TV programs, and Tving, the OTT service provided by CJ HelloVision. Unfortunately, both services have shown disappointing results in both user base and revenue. One explanation for this is Korean viewers' sensitivity to price (Lee, Lee, & Choi, 2007; Yim, 2013). With alternative ways to obtain online content, illegal downloading of online video content is prevalent (Kim, 2015). Furthermore, for paid VOD content, Korean viewers are highly dependent on IPTV services and purchase transactional VOD based on individual content watchable for a limited amount of time. IPTV accounts for 72% of the VOD revenue (Nasmedia, 2014) and reaches 61% of all households. The mediocre performance of OTT players in Korea may also be driven by the lack of strategic awareness of various players concerning OTT. Content providers recognize OTT as an additional outlet for content rather than as an independent source of profit; it was a defensive move in an environment of increasing use of mobile technologies. Telecom operators also entered the OTT market in the form of mobile IPTV services, which were mainly provided free of charge as bundled packages. This lack of motives partly explains the resulting growth of OTT services.

2.2. Previous literatures on OTT services

Despite the radical changes that OTT services have brought to the media and entertainment industry, the literature on the subject remains fairly limited. Common research themes so far can be summarized in terms of several threads. First, the growth of OTT services is explained through various case studies. Chung (2014) describes the new online streaming services of Netflix and Hulu; others emphasize the rise of OTT services based on the characteristics and origins of the operator (Kim, 2015; Lee, 2012; Park, 2011). Second, the viral impact of OTT services on the traditional media industry is commonly discussed. Kim, Kim, and Nam (2016) speculates the competitive dynamics between OTT and traditional pay TV platforms through niche analysis. Findings shed light on how incumbent platforms are affected by showing how OTT platforms overlap or are competitively superior over existing services. Han (2014) creates a Technology–Policy–Consumer (TPC) model and analyzes how the launch of OTT services has affected US media industries on the dimensions of technology/industry, public policy, and consumer/culture. Analyses of OTT services revolutionizing the traditional production, distribution, and consumption stages also provide an important perspective in understanding the new features and potential trends of the media industry triggered by OTT services (Banerjee, Rappoport, & Alleman, 2014; Kim, 2015).

Third, user motivations for adopting OTT services have been investigated by a number of scholars (e.g., Lim & Lee, 2013). Comparing TV consumption motivations, Cha and Chan-Olmsted (2012) examine how OTT services can serve as a substitute for TV. Cha (2013) predicts consumers' motivational factors for using OTT services using the Technology Acceptance Model (TAM). Finally, as various companies seek to extend their services to online video streaming industries, regulations regarding net neutrality or suggestions on how to control the new industry are reviewed (e.g., Cho, 2011).

Moon and Park (2015) indicate that the business performance of OTT players is not determined by the OTT service launch date or company size. Rather, consumer intentions to subscribe to pay OTT services are emphasized as the most important factor in sustaining a company's OTT business. Despite the importance of creating a sustainable price model for OTT services, there is a lack of rigorous research on the promotion of online video subscription. Therefore, this study analyzes the attributes that are important for OTT consumption, and ultimately finds the marginal price that consumers find acceptable.

2.3. Previous studies on WTP for media content

WTP is a term widely used in economics or marketing research to measure potential demand from consumers based on the perceived value of an item (Wertenbroch & Skiera, 2002). WTP is applied to evaluate a new technology or policy (Ratcliffe, 2000),

design optimal pricing strategies, and predict demand for new products (Voelckner, 2006). Although there are limits to the use of WTP in that it is an unobservable construct depending on individual, situation-specific value elicitation (Voelckner, 2006), the concept helps understand the attitudes and expectations of consumers by quantifying the psychological utility behind consumption behavior (Kim & Han, 2009). One of the prominent benefits of estimating WTP is that it enables the quantification of an unobservable value and potential demand into monetary terms.

In the media industry, several studies have investigated WTP for content in various market segments such as digital news content (Chyi, 2005; Kim & Song, 2011; Kim, Kim, Yang, & Kim, 2014) and mobile IPTV reception (Kim, Yoo, & Joung, 2014). WTP has often been applied to examine license fees for public broadcasting services (Jeong & Yoo, 2008; Lee, Oh, & Choi, 2012; Song, Yoo, & Kim, 2012). Notably, in earlier research, Ehrenberg and Mills (1990) empirically demonstrated the need for the BBC to increase its fee to increase viewer utility. WTP studies often measure the potential utility of emerging services such as cable television (Yoo, 2002), terrestrial DMB services (Byun, 2004), and digital terrestrial broadcasting (Jeong & Yoo, 2008). Such studies have practical implications for pricing strategies. Kim et al. (2014) analyzed the WTP of integrated news platforms under the N-screen environment and found that users' WTP was 30% of the actual price tag, suggesting that pricing should be reconsidered.

Yim (2013) notes that the price of media content depends on the demand from consumers rather than the cost recorded on the supply side. Traditionally, content providers have relied on an advertising-based free model that did not include direct demand from viewers. However, the rise of OTT services reflects a change toward consumers instead of advertisers paying directly for content. This means that the latent intent to pay for content is becoming increasingly important.

Quantifying WTP is especially critical in the Korean and Chinese context. Possibly because of low recognition and nascent institutional copyright norms, Korean and Chinese viewers are sensitive to the price of VOD content. The mature illegal market provides attractive and easy alternatives for viewers to watch the content at no cost or at a low price. Such sensitivity has been empirically identified in various studies on attitudes to online content experience. While Seol and Bong (2009) identify price as one of the largest barriers for IPTV usage, Lee et al. (2007) and Yim (2013) find price to be the most important factor in persuading consumers to purchase VOD content. Hence, this study is an attempt to estimate the monetary value of OTT services in terms of WTP.

3. Research design

3.1. Conjoint analysis and important attributes

Conjoint analysis is a popular method for analyzing the structure of consumer preferences. Conjoint analysis is applicable for situations in which a consumer must manage options that vary simultaneously across two or more attributes (Green, Krieger, & Wind, 2001). It assumes that consumers make decisions among products on the basis of their characteristics or attributes, and that trade-offs among attributes result in the final selection (Voelckner, 2006). As the part worth that consumers place on attribute levels may be inferred from conjoint analysis, the method has been widely used in market research (Miguel, Ryan, & McIntosh, 2000). Respondents are asked to express their preferences by ranking attributes or by choosing between alternatives within a set of attributes (Kofteci, Ergun, & Ay, 2010). Therefore, a conjoint analysis is conducted through a carefully designed survey in which respondents are given a sequence of choice sets. The analysis follows the steps of identifying and layering key attributes, constructing options, designing the survey, and collecting data.

Attribute selection is an important process in conjoint analysis. Considering the growing potential of the OTT industry, the choice of attributes was mainly based on the competitive features that OTT players are striving towards. Four attributes were chosen for this study: recommendation system, resolution, viewing options, and price. The order of the attributes follows the steps of the user experience. The stages of OTT consumption usually begin with searching for content, selecting content, paying, and watching the content. OTT services provide a wide range of content and channels, many of which are unnoticed by viewers (Abreu, Almeida, Teles, & Reis, 2013). The vast options necessitate that viewers search for and narrow down choices, either by themselves or with the help of recommendation systems. The heavy investment of Netflix in developing algorithms to provide a personalized recommendation system shows that the ways in which OTT services recommend certain content can affect consumer satisfaction and WTP. Digitalsmiths (2015) reported that an increasing number of people are frustrated about searching for content, and more people report a desire for personalized recommendations.

The next attribute is the level of resolution or image quality that is an increasingly important factor of competitiveness, with the race for higher resolution pushed by both business and government initiatives. High-definition, or high-quality video content, not only enhances consumer satisfaction but provides a source of additional profit (Choi, Lee, & Cho, 2009). Key OTT players actively engage in strategic partnerships to guarantee high quality resolution, such as the partnership of Netflix with LG TV for 4 K contents (Rody-Mantha, 2016). The next stage is to select how to watch the content. The N-screen environment has enabled various ways of viewing video content: streaming through TV sets or watching downloaded versions offline on smartphones. Providing more options whereby people can consume content provides utility because it brings more freedom and flexibility in content consumption. Sky UK, the premier pay TV provider in the UK, launched "Sky Go Extra," which enables users to watch downloaded content offline at a price premium, resulting in one of its most profitable products (Sky UK, 2015). Netflix also announced its update to enable downloaded content to be watched offline. This change in strategy reflects the strong demand of international consumers to have wider and more flexible accessibility on-the-go (Fung, 2016). Price is included as the last attribute of the study to estimate the consumer's overall WTP for services of such quality. The importance of each attribute is discussed further below.

3.2. Recommendation system

The first attribute pertains to the recommendation system. While consumers can now easily search for and obtain information from various sources online, from another perspective, users are distracted by excessive information. Exposure to numerous online sources increases consumers' difficulty in finding necessary or reliable information. Aware of the distress that this causes, companies are beginning to offer personalized recommendation services to help people find the required products or content (Jeckmans, Beye, Erkin, Hartel, Lagendijk & Tang, 2013). While recommendation algorithms are commonplace in various content platforms, most remain at the level of providing the most popular content or most common searches. Adding a personal touch to the recommendation system can be seen as providing additional value for consumers. In recent years, recommendation services have gained such popularity and success that over 35% of sales at Amazon and Netflix come from customized recommendation services (Love, 2014). Efforts to develop more intricate and precise recommendation systems have been made by various OTT players. For instance, in 2009, Netflix held a competition for users to create ways of improving personal movie recommendations. The company awarded "BellKor's Pragmatic Chaos" team a grand prize of 1 million USD for increasing the accuracy of customer preference prediction by 10.06% compared with that of Cinematch.[ii] The case of Netflix highlights that enabling a sophisticated personalization system requires high levels of investment and strategic efforts. Thus, there are two layers of (1) recommending popular content and (2) recommending personalized content.

3.3. Resolution

Using 4 K Ultra High Definition (UHD), which delivers four times as much detail as 1080p Full HD, is a growing trend. First introduced in 2013, the new resolution format was one of the most anticipated innovations seen at the International Broadcasting Conference (IBC) 2015. 4K-enabled devices and software, including 4 K TV sets, are becoming more affordable and more widely available, signaling the advent of the 4 K era (Rider Research, 2014). A number of streaming video operators such as Netflix and Amazon Studios are quickly responding to these new trends by creating and providing UHD content. A wide selection of original series, shows, and movies are being tested using 4 K video streaming services in Asia. For example, Dalian Tiantu Cable Television Network C. Ltd., China's leading local cable operator, became the first in the country to broadcast a 4 K UHD channel in 2014 (AsiaOTT, 2014). Lee, Choi, and Lee (2015) note that large screen TVs and a high-definition experience have a positive impact on the perceived usefulness and perceived ease of use of UHD TV. They also imply that such benefits from UHD content significantly influence people's WTP for OTT services. Given that content, platform, and device providers are beginning to compete in commercializing 4 K content, the two layers here involve (1) providing content up to an HD standard and (2) providing 4 K content.

3.4. Viewing options

Viewing options are the ways in which people watch video content. While OTT services started as VOD streaming services, live streaming services have been added. In addition, some services enable users to download and watch content offline. Pooq, a representative Korean OTT service, currently provides three price plans according to viewing options. China's representative OTT players, Youku, Tudou, and iQiyi, also provide all of the above services. Viewing options layers are thus concerned with (1) VOD streaming, (2) VOD streaming and live streaming, and (3) VOD streaming, live streaming, and downloading.

3.5. Price

The final product attribute concerns price, which is critical in estimating the WTP in terms of numerical values. The importance of price has been identified in various studies. Lee et al. (2007) and Lim (2013) emphasize that price is a vital attribute in determining decisions to consume VOD services. Netflix Korea offers three distinct price plans: basic (9,500 won; 8.3 USD) standard (12,000 won; 10.5 USD), and premium (14,500 won; 12.7 USD). The price range is considered slightly higher in comparison with the incumbent OTT and cable TV services provided at a price range between 3,900 (3.4 USD) and 14,900 won (13.1 USD). Meanwhile, as of 2016, the average monthly price for a premium subscription in China is about 20 yuan (3 USD). Youku and v.qq.com offer video services at 20 yuan and iQiyi at 19.8 yuan. Little variation in price or service quality is seen in China. Considering the price plans of Netflix and comparing the current price of Korean and Chinese OTT services, the price layers in this study are (1) 6000 won (5.3 USD), (2) 10,000 won (8.8 USD), and (3) 14,000 won (12.3 USD) for Korea and (1) 12 yuan (1.8 USD), (2) 20 yuan (3 USD), and (3) 28 yuan (4.2 USD) for China. Table 1 summarizes the key attributes and layers used for the conjoint analysis.

3.6. Choice sets and survey design

For the conjoint analysis, respondents were asked to make several pairwise comparisons and indicate their preferred option. Discrete choice options need to be built into a model based on the identified attributes. In this study, an orthogonal main-effects model was used. Orthogonality requires strict independent variation of levels across attributes, in which each pair of levels appears

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[ii] http://netflixprize.com

Table 1
Attributes and levels used in conjoint analysis.

Attributes	Levels
Recommendation system	Recommends popular content
	Recommends personalized content
Resolution	Offers HD/Full HD content
	Offers 4 K UHD content
Viewing options	VOD streaming only
	VOD streaming + live streaming
	VOD streaming + live streaming + download
Price	(KOR) 6000 won (5.3USD) (CHN) 12 yuan (1.8USD)
	(KOR) 10,000 won (8.8 USD) (CHN) 20 yuan (3 USD)
	(KOR) 14,000 won (12.3 USD) (CHN) 28 yuan (4.2 USD)

an equal number of times in combination with all other attribute levels (Johnson et al., 2013).

With two attributes at two levels each and two attributes at three levels each, a total of 36 (=2×2×3×3) alternatives would have to be tested to account for all possible combinations of the four attributes. However, it is unrealistic to compare the 630(=36C2=36! /(36-2)! 2! =(36×35)/2 choice tasks derived from the 36 descriptions because this would confuse and fatigue respondents (Paul & Wind, 1975). Therefore, we used the fractional factorial design suggested by Green (1974) to reduce the number of combinations to a manageable size. The term "fractional factorial design" refers to an experimental design with a subset (fraction) of the full design covering the most important features but requiring only a fraction of the effort and resources (Chrzan, 1994). Following the fractional factorial design, nine (=36/(2×2)) alternative cards were evaluated.

With the nine alternative cards, 36 (=9C2=9! /(9−2)! 2! =(9×8)/2 choice sets were drawn. Of the choice sets, there are implausible comparisons where the price level is lower despite the dominance of advantageous attributes. Eleven implausible comparisons were deleted, leaving 25 choice tasks for the actual survey questionnaire. The 25 choice sets were divided into three groups (two groups with eight combinations and one group with nine combinations). To increase the level of accuracy, respondents were provided with background information on OTT services and core attributes before choice sets were administered. In addition, a holdout card was inserted into each group to filter out unreliable responses. Thus, one group was given a total of 10 questions, nine valid choice sets and one screener question, while the other two groups were assigned a total of nine questions, eight of which were valid and one of which was a screener. The sample choice set used in the survey is shown in Appendix A.

4. Methodology

4.1. Data collection

Two separate online surveys were conducted in Korea and China by a professional online survey agency, "Macromill Embrain." Online surveys were conducted from October 22 to 27, 2015 in Korea and from November 9 to 12, 2015 in China. The targeted survey participants were those with experience of watching video content through a TV, PC, or mobile phone. The surveys were conducted throughout the country with both males and females aged between their 20 s up to 50 s. In Korea, of the 614 initial survey answers, 109 were found to be ineligible. Thus, 505 cases were used in the actual analysis. In China, a total of 509 responses were collected. After unreliable responses were filtered out based on a holdout card test, 381 responses were examined in the final analysis. The demographic information of the respondents is shown in Table 2.

4.2. Random utility model

To find MWTP for OTT services, a multinomial logic model incorporating random utility theory (McFadden, 1973) was adopted. The random utility model structure is as follows.

$$U_{ij} = V_{ij}(Z_{ij}, \quad S_i) + e_{ij} \tag{1}$$

In Eq. (1), U_{ij} represents the indirect utility function of an individual respondent i of choosing alternative j. V_{ij} is the deterministic component, while e_{ij} is the stochastic term reflecting the unobservable factors in the individual's utility function. V_{ij} refers to a function related to the attributes in alternative j chosen by respondent i (Z_{ij}) and the characteristics of respondent i (S_i). Respondent i will choose the alternative j when the utility function of alternative j is higher than all other alternatives in choice set H_i ($U_{ij} > U_{ik}(k \in H_i, k \neq j)$). Therefore, the probability that respondent i will choose alternative j can be represented by Eq. (2).

$$P_i(\text{j} \mid H_i) \quad = P(V_{ij} + e_{ij} > V_{ik} + e_{ik}) \quad = P(V_{ij} - V_{ik} > e_{ik} - e_{ij}) \tag{2}$$

The multinomial logit model assumes that the error terms of utility functions are independently and identically distributed.

Table 2
Demographic information of the respondents.

	Korea		China	
	N	%	N	%
Gender				
Male	250	49.5	185	48.6
Female	255	5.5	196	51.4
Age				
20 s	127	25.1	101	26.5
30 s	133	26.3	91	23.9
40 s	129	25.5	103	27.0
50 s	116	23.0	86	22.6
Income (per month)				
below $1500	82	16.2	120	31.5
$1500–$3000	183	36.2	162	42.5
$3001–$4500	146	28.9	59	15.5
$4501–$6000	59	11.7	23	6.0
above $6000	35	6.9	17	4.5

Assuming that the random terms are independently and identically distributed, the multinomial logit model predicts the probability of a particular option being selected over the total utility of all options, thus estimating the utilities for each layer of each attribute (Chrzan, 1994). The choice probability of Eq. (2) can be expressed by Eq. (3).

$$P_i(j \mid H_i) \quad = \quad \frac{\exp(V_{ij})}{\sum_{k \in H_i} \exp(V_{ik})}$$

(3)

The multinomial response is a result of choices made for utility maximization. The survey asked respondents to choose between three alternatives, two combinations and one 'no preference' option, whereby any respondent i could choose either 'yes' or 'no' for alternative j. Eq. (4) refers to this log-likelihood function.

$$1nL = \sum_{i=1}^{N} \sum_{j=1}^{3} (y_{ij} \cdot 1n[P_i(j \mid H_i)])$$

(4)

In Eq. (4), the value of y_{ij} is 1, and $1(\cdot)$ is an indicator function. $1(\cdot)$ has a value of 1 when respondent i chooses alternative j from the three alternatives, and 0 otherwise. The parameters of this log-likelihood function can be estimated by the maximum likelihood estimation method.

To calculate the respondents' MWTP, the deterministic component (V_{ij}) of the indirect utility function can be represented as a linear combination function as in Eq. (5). In Eq. (5), Z_1 to Z_3 denotes each attribute vector and Z_p represents the price attribute vector. β_k refers to the calculated parameters of each attribute.

$$V_{ij} = \quad \beta_1 Z_{1, \ ij} + \beta_2 Z_{2, \ ij} + \beta_3 Z_{3, \ ij} + \beta_p Z_{p, \ ij}$$

(5)

Finally, by computing the total derivative, the MWTP value for each attribute can be obtained.

$$MWTP_{Z_k} \quad = \quad - (dV/dZ_k)/(dV/dZ_p) \quad = \quad -dZ_p/dZ_k \quad = \quad -\beta_k/\beta_p$$

(6)

A consumer's total MWTP for OTT services can be estimated by summing all of the MWTP values.

5. Results

5.1. Chinese consumers' WTP for OTT services

To estimate the coefficients of Eq. (5), multinomial logistic regression was conducted using SPSS 19.0 software. The regression coefficients were measured using maximum likelihood estimation. The null hypothesis was that all coefficients of the attributes would be zero. The survey results rejected the null hypotheses at the 1% level of significance, $-2LL=90.34$, $p < .001$.

The results of the estimation are presented in Table 3. All of the attributes were statistically significant: recommendation system ($\beta=.261$, $p=.017$), resolution ($\beta=.386$, $p=.001$), viewing options ($\beta=.185$, $p=.002$), and price ($\beta=-.037$, $p < .001$). Coefficients of the recommendation system, resolution, and viewing options were positive, meaning that an improvement in the level of each attribute will increase utility for the Chinese respondents. In contrast, price had a negative coefficient value, implying that an increase in the level of the price attribute will decrease the utility of the respondents. The data show that Chinese consumers perceive resolution to be the most important attribute of OTT services. The recommendation system was ranked as the second most important attribute, and viewing options were considered the least important.

Table 3
Estimation results of the multinomial logit model.

Attributes	Coefficients (Wald Chi-square)	
	China	Korea
Recommendation system	.261 (5.73)[*]	.510 (30.21)[***]
Resolution	.386 (11.35)[***]	.198 (5.69)[*]
Viewing options	.185 (9.92)[**]	.398 (67.53)[***]
Price	−.037 (41.17)[***]	−.0003 (561.50)[***]
Number of observations	6340	8396
Log-likelihood	90.34	58.47
p-value	*p* < .001	*p* < .001

[*] *p* < .05.
[**] *p* < .01.
[***] *p* < .001.

MWTP can be obtained by dividing the coefficients of each attribute by the coefficient of price attributes. The results are shown in Table 4. Respondents were willing to pay 7.1 yuan (1.1 USD) for the improved recommendation system, 10.5 yuan (1.6 USD) for better resolution, and 5.0 yuan (.7 USD) for diverse viewing options. In summary, consumers in China were willing to pay a total of 22.6 yuan (3.4 USD) per month for OTT services that offered personalized recommendation systems, 4 K UHD resolution, and a wider range of ways of watching content.

5.2. Korean consumers' WTP for OTT services

The log-likelihood ratio test showed that the model was statistically significant (−2LL =58.47, *p* < .001). This implies that all of the attributes affected the respondents' utility (Table 3). The utility of each attribute is shown in Table 3. All of the attributes were statistically significant. These results show that the recommendation system (β=.510, *p* < .001) was perceived as most important, followed by viewing options (β=.398, *p* < .001) and resolution (β=.198, *p*=.017). The negative coefficient of price (β=−.0003, *p* < .001) reveals that an increase in price negatively affects consumer utility.

The results of the MWTP are presented in Table 4. The recommendation system accounted for the highest MWTP at 1627 won (1.4 USD), followed by viewing options at 1270 won (1.1 USD) and resolution at 632 won (.6 USD). The sum of the attributes indicates a total WTP for OTT services rounded up to 3530 won (3.1 USD).

To sum up, while all of the recommendation system, resolution and viewing options appeared to be significant attributes of OTT services, optimal pricing strategies and the core attribute of OTT services require further discussion. For OTT providers with limited budget and resources, different attributes should be emphasized depending on the country and the level of significance of each attribute. In order to succeed in the Chinese market, OTT services should strive to provide satisfactory picture quality by supporting 4 K UHD. Also, recommendation system that promotes personalized content as well as popular content will be needed. Meanwhile, enabling various viewing options such as live streaming or download services hold weaker priority. Chinese OTT service providers can decide to offer only VOD streaming services because Chinese consumers have lower willingness to pay for the viewing options. On the other hand, in Korean OTT market, there is a greater need for personalized recommendation systems. However, rather than trying to accumulate a wide collection of 4 K UHD content, Korean OTT services should focus on refining the recommendation system and providing a variety of viewing options including live streaming and downloading services.

6. Discussion and conclusions

The Asian OTT market is perceived as having significant growth potential. However, for a company to thrive in the Asian market, an appropriate pricing strategy for OTT services is needed. While Japanese consumers are familiar with purchasing the content they consume, Korean and Chinese consumers show less understanding that content is valuable and deserves to be purchased. To sustain

Table 4
Marginal willingness to pay.

Attributes	Marginal willingness to pay	
	China	Korea
Recommendation system	7.1 yuan (1.1 USD)	1,627.4 won (1.4 USD)
Resolution	10.5 yuan (1.6 USD)	632.0 won (.6 USD)
Viewing options	5.0 yuan (.7 USD)	1,269.7 won (1.1 USD)
Total	22.6 yuan (3.4 USD)	3,529.1 won (3.1 USD)

the growth of OTT services in China and Korea, an increase in average rate per user (ARPU) is crucial. Finding strategic ways to attract and solidify the subscriber base is thus a fundamental challenge for OTT service providers. To encourage the growth of the OTT industry, this study empirically investigated key attributes and examined Korean and Chinese consumers' MWTP for OTT services, using a conjoint analysis. Thus, a major contribution of this paper is that it deals with the quantified value of consumers, thereby supplementing academic speculation concerning the user perspective. The key findings are as follows.

This study identified the recommendation system, resolution, and viewing options as important attributes of OTT services that influence Chinese and Korean consumers' MWTP. The most important attribute for the average Chinese consumer of OTT services is resolution, followed by the recommendation system and viewing options. This suggests that OTT players can market their services strategically by offering UHD content to Chinese customers. Netflix and Amazon's current strategy in accumulating a wide collection of 4 K UHD content is thus a rational move that will greatly impact the company's future entry into the Chinese market.

In Korea, the recommendation system was ranked as the most valuable attribute, followed by viewing options and resolution. The rapid increase in the pool of content induced a greater need for personalized recommendation systems. However, most Korean OTT or content platform providers emphasize their large pool of content in their marketing strategy. While specific content can be searched for and obtained by the user, no broad array of personalized content suggestions is available from current domestic OTT services, content platforms, or illegal online websites. In addition to current Korean marketing strategies, which emphasize content diversity, more efforts to offer refined curation services are therefore needed to attract and enrich the consumers' overall OTT experience. Netflix is a prime example of utilizing a comparatively small pool of content to deliver greater satisfaction to consumers through its refined personalization system.

Being ranked first by Chinese consumers (1.6 USD) but last by Korean consumers (.6 USD), the resolution attribute poses an interesting topic for discussion. The lack of importance of resolution in Korea could suggest that consumers already enjoy satisfactory picture quality for their video content. In contrast, Chinese OTT services mostly provide rapid content updates at no cost with heavy advertising. The free consumption may come at the price of high-quality resolution. Such an OTT environment also could explain the tendency to stream rather than to provide other options for viewing. Because Chinese consumers mostly stream their content, their preference for downloads or linear TV could be lower than for other attributes. Korean consumers, for whom free OTT services are not the norm, may be burdened by the high data price plans that are required to watch online videos, leading to their preference for various viewing options that allow offline viewing as well as streaming services.

Based on our analysis, Chinese consumers' overall MWTP was 22.6 yuan (3.4 USD) per month for OTT services that offer a personalized recommendation system, 4 K UHD resolution, and alternative ways of watching content. Considering that the current average price for premium OTT services is about 20 yuan per month, service providers can consider raising the price of premium streaming services by including some of the attributes mentioned in this study. Results show that Korean respondents' overall MWTP for OTT services was around 3530 won (3.1 USD). Prices for Korean OTT and cable TV services range between 3900 and 14,900 won. In other words, user WTP is lower than the current price range, which implies that either the market price is unreasonable or that OTT services do not provide value for money at this price. The former reason is very consistent with the situation in Korea. When online video services first began in Korea, they were recognized as a mere complementary add-on service, especially for mobile network operators. Thus, the players took a passive defensive attitude rather than approaching the market strategically. Based on this recognition, the price strategy was adopted with insensitivity. This also holds for the price decisions and the service offered by traditional broadcasters. Thus, perceiving online video services merely as a means to expand the original business resulted in a lack of serious speculation concerning business strategy or pricing, without proper research or understanding of the consumers.

The difference in willingness to pay for OTT services between Chinese consumers and Korean consumers can be explained by different market conditions in the two countries. China's OTT services are mainly provided by major Internet service providers that offer a combination of free and premium services. Chinese consumers' relatively high WTP proves that, rather than just free contents, users may be willing to take advantage of premium services that the same Internet service provider delivers and have improved quality experiences. On the other hand, the relatively low WTP intentions of Korean consumers reflect local OTT service providers' lack of differentiation from other alternative channels. Although OTT service providers offer genuine services, consumers seem to feel less compensated or attracted to the service. One of the important reasons could be Korea's high pay TV penetration rate. According to Ovum (2014), Korea's pay TV market is one of the top ten in the world with a projected penetration rate of 95% in the year 2018 (Statista, 2016). Other than OTT services, Korean consumers have advanced alternative services without paying much for those services. Therefore, the lack of distinct features or niche positioning strategies discourages Korean consumers to pay high prices for domestic OTT services.

Based on the four suggested attributes, the study hopes to contribute to helping OTT service providers effectively position and provide innovative services to consumers. First, in relation to China's positive intentions to pay for OTT contents, the advertisement-oriented business model could be reconsidered. Strategic promotion of premium services can be developed such as advertisement-free subscriptions which could enhance customer satisfaction and improve profitability of the firm. However, in Korea, efforts to keep their prices lower with a mix of subscription fees and advertising will be needed. Second, willingness to pay for OTT services in China and Korea were found to be lower than that of US or European consumers. While there are many attributions to such cause, the study asks for collaborative awareness and cooperation in protecting the copyrights of various contents that are fled into the black market. The study findings also call for government-initiated policies and support.

A number of limitations in this study should be considered in future research. First, we only considered a small number of attributes, owing to the methodological characteristics of the conjoint analysis. With additional attributes, more accurate and reliable results could be obtained. For example, according to iResearch (2014), Chinese consumers seem to regard content quantity (57.3%),

resolution (53.4%), and playing speed (52.0%) as the key factors in choosing online video websites. Korean OTT players also set a high value on providing large pools of content. However, the conjoint analysis only allows the analysis of nominal variables that can be divided into hierarchical layers. Variables such as content quantity or diversity should therefore be approached in different methods as other motivating factors in consumers' WTP for OTT services in future researches. Other attributes, such as content genre, could affect consumer viewing behavior. For example, consumers who are highly attracted to sports content may prefer linear TV, while ardent movie fans may favor downloading individual film titles. Nevertheless, this study aimed to reflect the realistic developmental stage of OTT platforms within Korea and China that mainly concentrates on TV drama or movies. As the OTT market continues to develop and the strategic moves of each OTT player diversifies, the mentioned attributes of content diversity or genre could be more meaningful avenues of research. In addition, similar research to this study could be conducted in other countries that have high ARPU for OTT services. Comparing the WTP of OTT services in other settings will likely yield interesting results and could contribute to improved OTT strategies across countries.

Acknowledgement

Appendix A

See Table A1 here.

Table A1
A sample choice set used in the survey.

Comparison 1	Alternative A	Alternative B	Alternative C
Recommendation system	Recommends popular content	Recommendspersonalized content	–
Resolution	Offers HD/Full HD content	Offers HD/Full HD content	
Viewing options	VOD streaming+live streaming	VOD streaming	
Price	12 yuan	20 yuan	
	☐	☐	☐
	Select Alternative A	Select Alternative B	Do not select either

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