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Estimating Switching Costs of Changing Social Networking Sites

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Abstract

This study's empirical analysis shows that the consumers' switching costs when changing SNS are less than that when changing BB service. SNS switching cost is estimated at JPY 944, while that in BB service is estimated at JPY 2864 (JPY 80 = USD 1 on 21st May 2012). According to these results, the switching cost of the former is approximately one-third of that of the latter. One of the reasons why SNS switching costs are smaller could be because of the current small number of friends on SNS. In this survey, approximately half of the respondents stated that their number of friends on SNS was less than 10.

Key Words:
Social Networking Sites (SNS), Switching Costs, Layers, Network Effects, Market Power

1 Introduction

Social Networking Sites (SNS) are one of the fastest growing applications on the Internet. Each of these single applications also functions as a communication platform, where users can communicate with one another, voice opinions, collect information, and use built-in applications such as games or schedulers. Recently in Japan, although global SNS such as Facebook, Google+, or Twitter are beginning to diffuse, local SNS such as mixi or Ameba continue to include a large number of active users. This indicates that there exist switching costs when changing SNS. Switching costs are defined as the various economic and psychological costs incurred when a customer changes service suppliers. Farrell and Klemperer (2007) reviewed previous studies regarding switching costs and covered both theoretical and empirical approaches. Although some authors provide counterexamples, in which switching costs can in fact reduce prices, most studies indicate that sufficiently high switching costs create market power. Many studies also have examined the role of switching costs in the telecommunications sector (Madden et al., 1999, Lee et al., 2006, Ida and Kuroda, 2009, Nakamura, 2010, Nakamura, 2011, etc.).

A supplier with market power in some layer exercising influence on other layers is often observed in various markets. Although the open nature of SNS of high share is currently observed, Nakamura (2011) points out that the presence of switching costs is a source of leverage. This paper aims to empirically examine the amount of switching costs that are incurred in SNS usage by

employing a web-based stated preference (SP) survey. To the author's knowledge, no such prior empirical evaluation has been conducted and only the market power of Microsoft and Google has been broadly discussed.

When estimating switching costs, the previous studies, such as Lee et al. (2006), Nakamura (2010), Nakamura (2011) and so on, generally utilized either data of price differences among suppliers or their discounted amount differences, even when a SP approach was employed. However, SNS do not generally charge a usage fee; therefore, it has become difficult to capture the switching costs by such price or discount differences. To assess the switching cost of SNS, this paper's SP survey focuses on broadband access (BB) service switching behaviors. First, the survey hypothetically assumed whether SNS was available if the current BB carrier was changed or continued to be used, and vice versa. Then, the switching costs of changes between BB and SNS are compared to evaluate the market power of SNS, which can be effective for future policy-making decisions about the Internet.

This study's empirical analysis shows that the consumers' switching costs when changing SNS are less than that when changing BB service. SNS switching cost is estimated at JPY 944, while that in BB service is estimated at JPY 2864 (JPY 80 = USD 1 on 21st May 2012). According to these results, the switching cost of the former is approximately one-third of that of the latter. One of the reasons why SNS switching costs are smaller could be because of the current small number of friends on SNS. In this survey, approximately half of the respondents stated that their number of friends on SNS was less than 10.

2 Switching costs, market power, and leverage among layers

In markets where switching costs are present, once a consumer begins to use the services of a specific company, that consumer is locked into that company's services. Hence, even though a supplier sets a price higher than other companies, that price is sustainable as long as the difference in price is below the switching cost. This is the same as a markup pricing situation in which a business operator with market power sets the price higher than rivals. The mobile number portability introduced in October of 2006 in Japan was a system that attempted to stimulate more vigorous competition by lowering switching costs in a mobile phone market that subscribers had become saturated to a certain degree.

However, it needs to be pointed out that from the standpoint of economic theory, promoting competition by lowering switching costs is not always desirable. In other words, it expands fierce competition for acquiring new users in the markets condition with switching costs which business operators assume. The presence of free phone programs, which were observed few years' ago in Japanese mobile phone market under the SIM (Subscriber Identity Module) lock

situation, is reflective of such conditions. Whether policies to lower switching costs are favorable or not must be determined from the perspective of which type of competition is more beneficial to society – competition for the acquisition of users or competition within a market in which users have already become locked.

Incidentally, the "Report of Assessment of State of Competition in Telecommunications Business Field, 2011. (draft)" published by the Ministry of Internal Affairs and Communications, discusses the influence on competition of services with market power within the upper layer of internet services. Although the open nature of SNS of high share is analyzed within this report (draft), Nakamura (2011) also points out that the presence of switching costs is a source of leverage. The aforementioned report also discusses iOS and Android platforms and SNS such as Facebook and Twitter from the aspect of upper and lower layer collaboration, and attention is being gathered on the competitive situation apart from infrastructure services, though it is gradually.

A supplier with market power in some layer exercising influence on other layers is often observed in various markets. The Pokémon Black/White (version 1) software for the Nintendo DS series (September 2010 release: Pokémon, Ltd.) enjoyed overwhelming popularity, selling a total of over 5 million copies in January of 2011, with the same Black 2/White 2 of the same series selling a 1.61 million in the first week of release. For example, it is an overwhelming sales volume in comparison to a popular software sold in the same period, Dragon Quest Monsters Terry's Wonderland 3D, (May 2012 release: Square Enix Japan, Ltd.) with sales of 510,000 in the first week. As can be ascertained from the software name, Dragon Quest Monsters Terry's Wonderland 3D is software exclusively for Nintendo 3DS (hereinafter referred to as "3DS"). 3DS is a new type of portable game console introduced by Nintendo in February of 2011. With unfavorable initial sales, the price for the game hardware was exceptionally lowered in August of 2011.

On the other hand, Black 2/White 2, which was released 1 month later than Terry's Wonderland, could be played on terminals older than the 3DS, such as the Nintendo DSi (hereinafter referred to as "old DS systems") If we infer the position of hardware vendor Nintendo, who wants to promote the 3DS, it seems that they probably wanted to promote 3DS with lower level layer which was complementary goods by selling the greatly popular Black 2/White 2 software, as software exclusively for 3DS. In fact, after the introduction of 3DS, Mario Brothers series (Nintendo Company, Ltd.), the popular series sold by Nintendo, as well as software released from other companies, were almost all released as 3DS exclusive software. However, from the upper level software vendors' position, the benefits of releasing software that could also be played on old DS systems which still overwhelm 3DS with the total cumulative sales are considerably large. There are certainly various pros and cons that go along with the decision of whether or not to make software that can be played on the old DS systems that include communication compatibility problems between 3DS and old DS systems, development period for high level compatible 3DS functions, and

upgrading the quality of the software, etc. However, it can be said that the example of the Black 2/White 2 sales strategy is indirectly exhibiting the influence on lower layer hardware markets by upper layer software venders who are experiencing overwhelming total sales volumes.

The same situation is occurring with smartphone platforms such as iOS and Android, and the exercise of influence to other layers by a brand with strong appeal is generally possible. It could be beneficial to investigate SNSs' influence on other layers.

3 The actual usage of social network services in Japan

This section examines the actual usage of SNS from the perspective of switching costs based on survey data (survey related to the use of SNS) from a Web questionnaire conducted by the author in March of 2012. The following is an overview of the survey:

1) Survey organization: Goo Research
2) Survey method: Web questionnaire survey by monitors
3) Period of survey: March 1-2, 2012
4) Sample number: 1,945 (Web monitors with no prior screening)
5) Age distribution: Invitations sent to ensure an equivalent ratio of participants in each age group: 10-19, 20-29, 30-39, 40-49, and 50-59.

When observing users of SNS, the frequently reported value is the number of active users. This survey investigated the following 4 items: (1) SNS that I participated in previously, but have already cancelled membership (2) SNS that I am registered with but am not currently using (3) SNS that I am currently using (Including occasional reading) (4) The SNS that I use most Survey item (3) is the close value to the so called "active user." Furthermore, the percentage of the total 1,945 of those in this survey who answered that the participant is currently using any of the SNS, (3) was relatively high at 61.7%. Regarding this point, because the title of the survey was "Questionnaire survey regarding the use of SNS," it can be considered that non-users may have avoided replying to the survey.

Upon examination of the most frequently used SNS (Figure 1) and currently used SNS (Figure 2) according to this survey taken in March of this year, many use Twitter and mixi in Japan with approximately equal number of users each. Other services in addition to mixi in Japan that are used frequently by some percentages of respondents are Ameba, Mobage, and GREE, and it is clear that domestic services are staking out a set share with respect to globalized services such as Facebook and Twitter. The "2012 White Paper on Social Media," released by Cross-marketing Ltd. and Tribal Media House Ltd. indicated the prevalence of overlapping use of multiple services by

users. Hence, the necessity of observing survey results from several perspectives to grasp the number of social media users is clear. In addition, it is estimated that the aspect of connections to specific people (though such service exists) is relatively low in importance for services centered on social gaming such as mobage and GREE in comparison to other SNS.

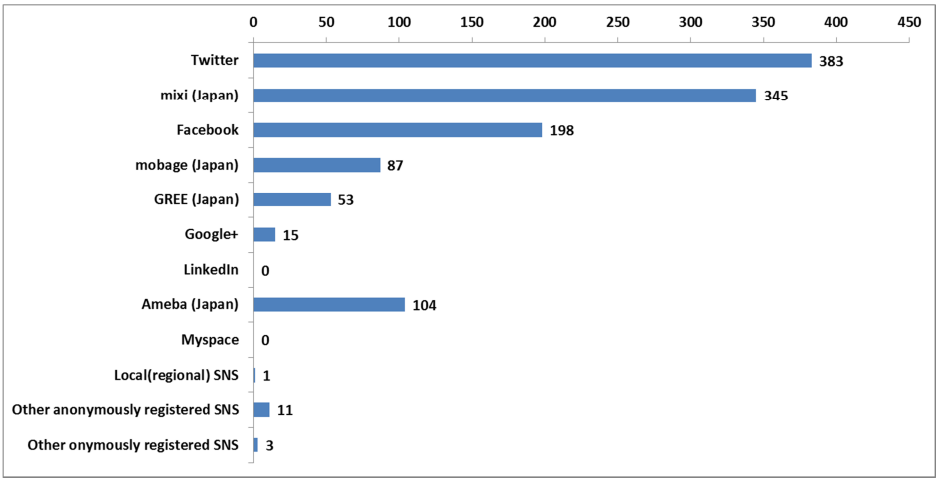

Figure 1: Most frequently used SNS

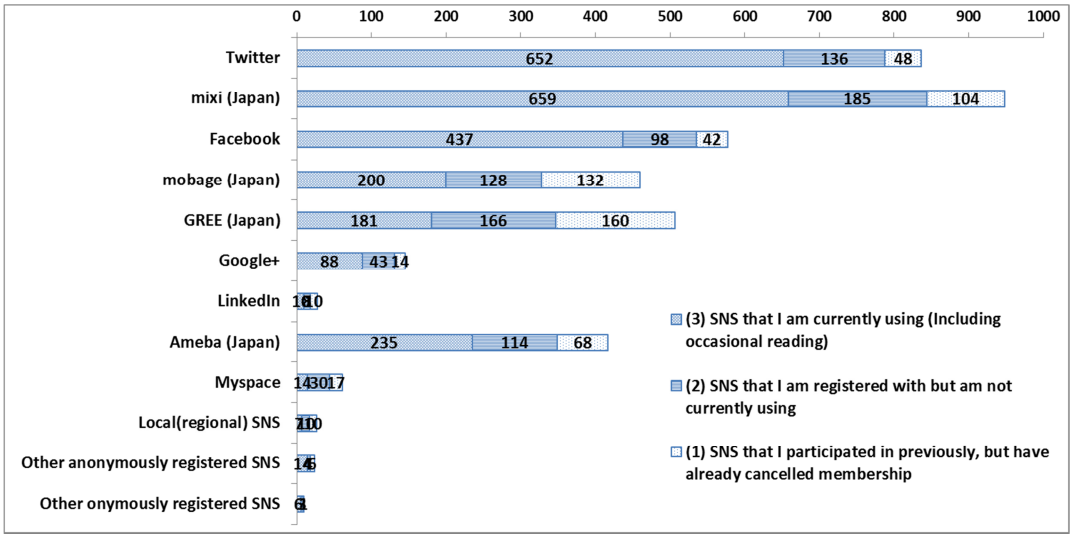

Figure 2: using/used SNS

Because the effect of networking with specific persons (calling circle effect) is relatively low in social gaming services, it can be considered that many respondents have canceled the service which resulted in low ratio of active users (=[Total of the SNS I currently use]/[SNS I am still registered with but not currently using + The SNS I currently use]). Next, see the surveyed results regarding the purposes of using SNS. Figure 3 is the results of the surveyed item, “Purpose for using

your most frequently used SNS." Figure 3 shows that half of those surveyed use SNS for the purpose of "communication with real acquaintances." Figure 3 shows the total individual results in response to this item for major SNS, Facebook, Twitter, and mixi. From Figure 3, it is clear that use of Facebook and mixi is similar, and that Twitter is used more for "encounter/communicate with real acquaintances" and "collecting information on private interests" than other services.

Lastly, the results of survey item "number of people connected on the SNS" is shown in Figure 4. Figure 4 are aggregated values of the survey results for all SNS used. Although there is a need to consider the inclusion of SNS that are visited occasionally or for gaming, the number of connections to people was relatively few with a significant number of respondents replying "nobody" or "fewer than 10 persons." The above simple tabulation suggests that the calling circle effect (a type of network effect) that engenders resistance to changing one's SNS is not very prevalent at this point.

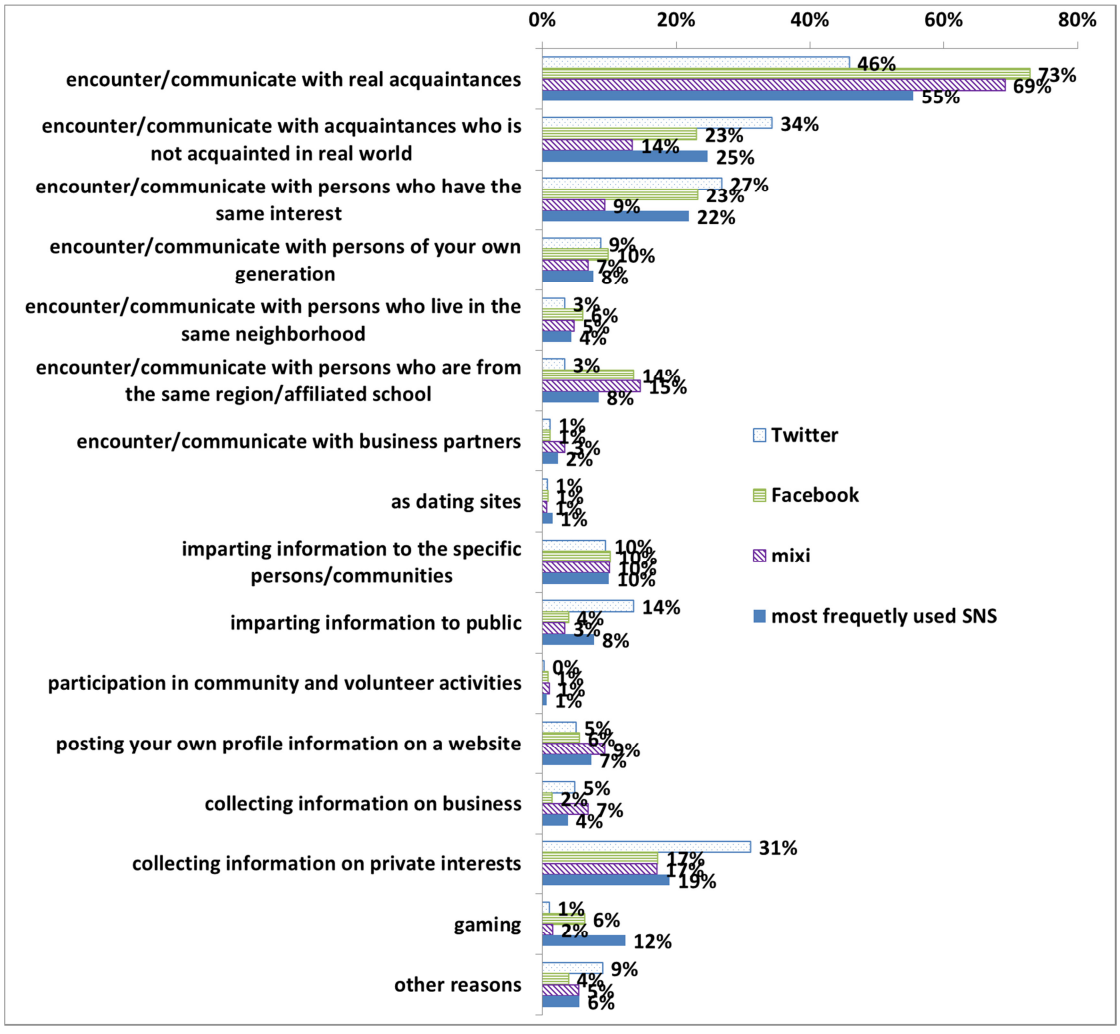

Figure 3: Purpose for using your most frequently used SNS

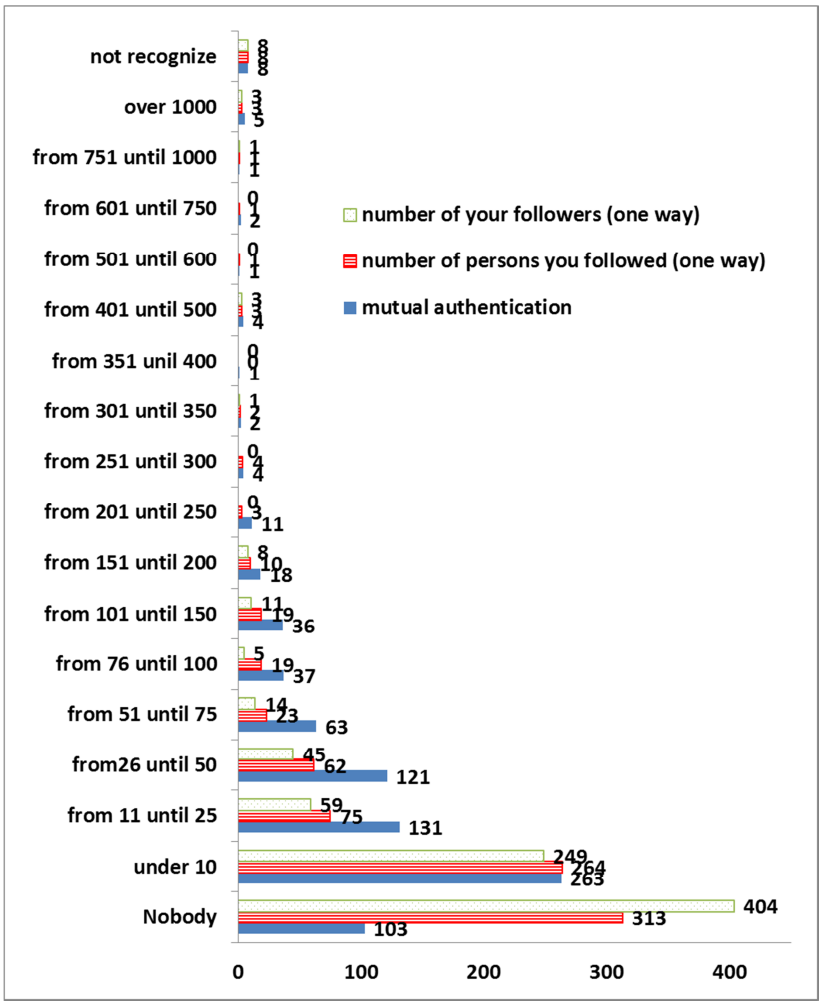

Figure 4: Number of people connected on the SNS

4 Aversion to changing SNS compared to changing broadband internet access provider

There has been much research accumulated regarding the measurement of switching costs related to the change of one's telecommunication carrier. In this survey, questions that compare aversion to switching one's SNS and one's broadband internet access provider (hereafter referred to as "BB provider") which is a lower layer service than an SNS were included. Specifically, the change of mobile phone carrier and the change of BB provider were each compared to switching one's SNS as pair.

Figures 5 and 6 show the survey result. It shows that the percentage of respondents with aversion to changing SNS was lower than those with aversion to changing the BB provider. These results are estimated to be related to the previously surveyed items showing relatively few numbers of friends on SNS and many respondents who use SNS for communication with real life acquaintances. In other words, at this point, it may be said the fact that the network effect ("calling

circle effect" to be more precise) of SNS is relatively small and that those users with whom users are connecting with are also real life acquaintances, makes changing relatively easier.

Question: Which would be more inconvenient and dissatisfying [changing your mobile phone service provider (home internet service provider)] or [changing the SNS you are currently using]. Please choose the answer that is the closest to your thought. *If you use multiple service providers, please answer the question as if you change the service provider that you use most frequently

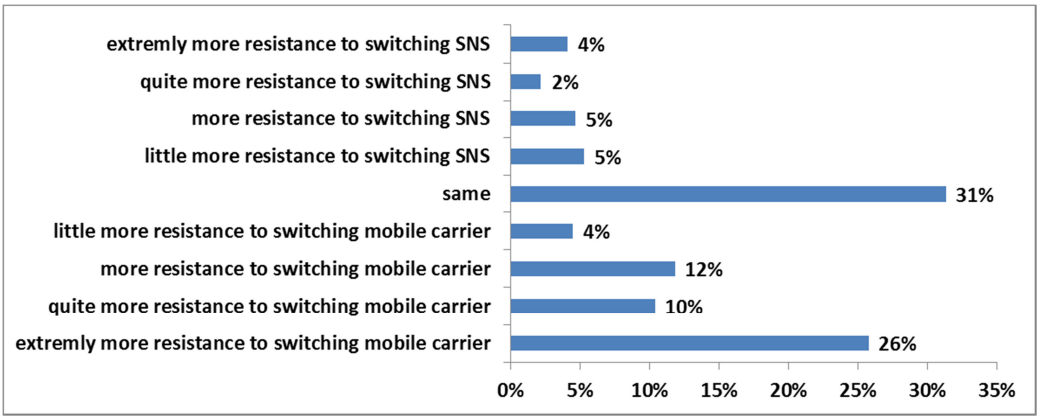

Figure 5: Comparison of aversion to switching SNS and mobile phone provider

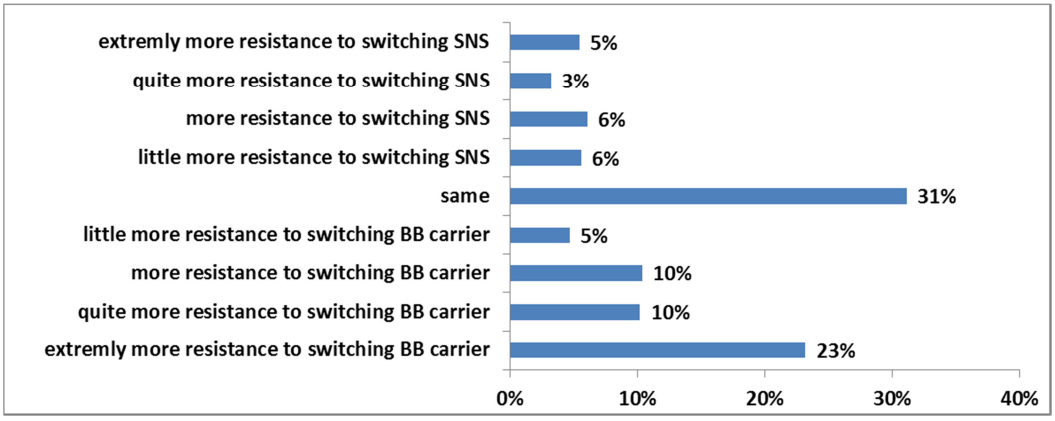

Figure 6: Comparison of aversion to switching SNS and broadband access provider

5 Measuring the switching cost of changing SNS

This section specifically measures the switching cost of changing SNS. Most past empirical analysis measuring switching costs has been analysis of data from surveys asking the respondents how much the cost of the new service would be cheaper than the service currently being used, so that they can switch (Lee et al. 2006, Nakamura, 2011). However, it is difficult to survey

switching costs of changing SNS that does not usually accompany monetary payment, in such method. Therefore, in this survey, the hypothetical situation is posed of “inability to use each SNS without the contract with a specific BB provider” and data was collected with questions that cause respondents to express their thoughts about changing their BB provider under those assumptions. It is an attempt to evaluate monetary switching costs of changing one’s SNS indirectly from its fee by assuming a discount from the fee paid to the BB provider accompanied by the contract.

Specifically the following 3 assumptions are made in the survey:

1. Although you are able to use your current SNS with the BB provider you are currently using at home, assume that you would not be able to use your current SNS if you change to a different BB provider. How much cheaper would your monthly fee have to be in order for you to change your current BB provider?
2. You are able to use your current SNS with the BB provider you are currently using at home, and would still be able to use your current SNS even if you change to a different BB provider. How much cheaper would your monthly fee have to be in order for you to change your current BB provider?
3. You are not able to use your current SNS with the BB provider you are currently using at home. However, by changing to a different BB provider, you would be able to use your current SNS. How much different fee would induce you to change your BB provider?

Regarding assumption 1, the respondent assumes that by changing to a different BB provider the respondent would not also be able to use the current SNS. Hence, in assumption 1, there is no benefit for the respondent to change BB providers as long as there is no assumed discount in the new service fee. Thus the response selections for the question in assumption 1 were various kinds of service fee discounts (new provider) and the respondent’s intention to change BB providers was inquired. From assumption 1, information regarding switching costs for both SNS and BB providers are obtained from the discount chosen by the respondent.

Next, assumption 2 is the same as the current condition in that the respondent would still be able to use the current SNS even without changing to a different BB provider. Assuming a contract with the current BB provider, realistic choices for assumption 2 should be the same as assumption 1 as there would be no benefit for the respondent to change BB providers without assuming a discounted fee, etc. Thus, various kinds of service fee discounts (new provider) were set up and the respondent’s intention to change BB providers was inquired, as in assumption 1. Information about the switching costs of changing BB providers only is obtained from responses to this question.

The final assumption 3 includes questions related to the situation that the respondent must change BB providers if the respondent wants to continue to use the current SNS.

Under this assumption, the respondent decides whether or not to change BB providers depending on the magnitude correlation of 3 elements: (1) The switching cost of changing SNS (2) The switching costs of changing the BB provider (3) The pricing benefits of switching (fee before and after switching). Response choices for (3) include positive and negative fee variations.

Using the data collected in this manner, the following discrete choice model is estimated with

"whether the respondent would switch BB providers (the variable: would switch = 1 and would not switch = 0)" as the dependent variable.

$$U_{ij} = CONSTANT_{ij} + \alpha \times SNS_{ij} + \beta \times PRICE_{ij} + \varepsilon_{ij}$$

The explanatory variable *SNS* is 1 if the respondent must change *SNS* and 0 if the respondent would be able to continue to use without making a change. The *PRICE* variable is the monthly service fee difference (JPY 1 000 per month) between before and after the change. Data regarding specific fees before and after changes is not obtained in this survey as respondents are responding only to fee variations before and after changing BB providers. However the fee prior to change in this survey was standardized as 0 due to the usage of estimates of only differential information from the discrete choice model estimates. Furthermore, the *CONSTANT* is a parameter for dummy variable of 0 if there is no change and 1 in case of a change of BB providers. In addition, U_{ij} represents the utility to respondents i gained by changing service providers (Change: j=1, No change: j=0). α and β are estimated parameters with ε as the Type I extreme value distribution with respondents i in condition j. The above estimation was performed with a binomial Logit model (the sample was limited to respondents currently using SNS).

The results of the estimation are as follows: the cheaper the *PRICE* is, the greater the expected utility (benefit) should be, with the *CONSTANT* parameter as the aversion to changing BB providers and the *SNS* parameter as the negative utility generated accompanied by the change of the current service. Although it is assumed all of these would be negative values, any of the parameter sign conditions would be consistent with sign conditions assumed in reality.

	Coefficient	Standard dev.	P value
Constant (BB switch:1, BB not switch:0)	-1.450	0.041	(0.000)
SNS (SNS switch:1, SNS not switch:0)	-0.503	0.035	(0.000)
PRICE (JPY 1000)	-0.538	0.013	(0.000)
McFadden Pseudo R-squared	0.236		

Table 1: Estimation Result

From the estimated result (Table 1), the estimated parameter of the change of *SNS*, the change of BB providers and the switching costs of each was performed with the following mindset. Parameters determining *PRICE* show how satisfaction increases from a JPY1 000 decrease in fee. Furthermore, parameters determining *SNS* show the degree in reduction of satisfaction from a change of *SNS*. Therefore, a value measuring how much is needed to financially compensate for

lower satisfaction that is accompanied by a change of *SNS* is calculated by eliminating the parameter determining *SNS* from the *PRICE* parameter. This value represents the switching cost. Regarding the change of BB providers, the lower satisfaction from changing BB providers can also be calculated in monetary terms by eliminating the same values by the parameter determining *PRICE* since the *CONSTANT* shows the lower satisfaction from changing BB providers. The results of the estimates show that the switching cost of changing SNS is JPY936/month while the switching cost of changing BB providers is JPY2 696/month.

6 Concluding remarks

The switching costs of changing SNS estimated in this paper were approximately 35% of the switching costs of changing BB providers. In other words, aversion of consumers to changing SNS is smaller and such a change is easier than switching BB providers. The simple tabulation of the survey shown previously also demonstrate that the aversion to changing SNS is relatively smaller than changing the lower layer communication carrier. Possible reasons for this are a relatively small calling circle effect of SNS at this point (the survey as of March of 2012), usage that is centered on communication with real life acquaintances, and the relatively easy change.

However, there is a high possibility that cost of switching of SNS would increase if its usage becomes more common while many people on the cutting edge use it widely such as for expressing opinions and for business. As this trend continues, there is also the possibility that the open nature of SNS between its current layers may also change. With regards to evaluation of competition outside of the communication service layer, there would be also a need to continue to consider and observe daily changes in ICT services carefully.

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